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CONTENTS.

Original Communications.

PAGE

Prophylactic Hygiene. By Professor Dujardin-Beaumetz..... 577
Arsenic in Leucocythæmia. By E. A. Barton, M.R.C.S. and R.C P..... 585
Therapeutics of Inflammatory Mastoid Disease. By G. Archie Stockwell, M.D., F.Z.S..... 589
Pichi in Gonorrhœal Prostato-Cystitis. By F. Gundrum, M.D..... 594
Orlando, Florida, as a Health Resort. By R. H. Peak, M.D..... 596
What is the Essential Cause of the Continued Fevers of Miasmatic Regions, and what Relation, if any, does Malaria bear to the Continuity? By B. Frank Humphreys, M.D..... 597
Massage Therapy: A Clinical Record, with some Comments. By A. Comstock, M.D..... 602

Leading Articles.

Physiology of the Third Stage of Labor. 606
Antipyrin in Whooping-Cough..... 608
The Action of Drugs upon the Liver..... 610
The Venom of the Rattlesnake and the Gila Monster..... 611

Reports on Therapeutic Progress.

Treatment of the Umbilical Cord..... 605
The Action of the Sulphate of Sparteine..... 613
Mercurialism in Lying-in Women..... 614
The Treatment of Whooping-Cough by Nasal Insufflations and by the Internal Use of Antipyrin..... 617

PAGE

The Comparative Value of Codeine and Morphine in the Treatment of Diabetes..... 618
Angina Pectoris of Syphilitic Origin..... 620
The Alkaline Treatment of Eczema..... 621
The Treatment of Migraine with Indian Hemp..... 622
The Treatment of Inveterate Ulcer of the Leg..... 623
Modelling Clay in Mastitis..... 623
Methods of removing Nasal Polypi..... 624
Iodide of Potassium in Cardiac Dyspnœa..... 624
The Surgical Treatment of Abscess of the Lung and Empyema..... 625
The External Application of Sulphur in Sciatic Neuralgia..... 626
The Treatment of Dyspepsia..... 626
The Treatment of Sleeplessness..... 628
Hydrastis Canadensis and Viburnum Prunifolii..... 628
Chloroform-Water as a Solvent for Drugs..... 629
The Influence of Salts of Rubidium and Cæsium on the Heart..... 629
The Treatment of Rebellious Ulcers by Multiple Incisions..... 629
Antipyrin, Acetanilide, and Solanine..... 630
Combined Chloroform and Cocaine Anæsthesia..... 630
Chloride of Methyl Spray in the Treatment of Chorea..... 630
Acetanilide in Confluent Smallpox..... 630
Capsella Bursapastores as a Styptic..... 631
Pharyngeal Congestion of Uterine Origin..... 631
A Means of reducing the Pain in Subcutaneous Injections of Antipyrin..... 631
Tannin in Dilatation of the Stomach..... 631
The Purgative Action of Glycerin Enemata..... 632
The Physiological Action of Senicio Canicida..... 632

PAGE

The Antiseptic and Astringent Properties of Camphoric Acid..... 632
The Local Treatment of Diphtheritic Angina by Salicylic Acid..... 632

Reviews..... 633

Correspondence.

Paris Letter..... 634
High Altitudes in Phthisis..... 637
Iodide of Potassium and Ergot in the Treatment of Meningitis..... 637
Treatment of Troublesome Cough..... 638

Notes and Queries.

The Congress for the Study of Tuberculosis..... 638
A Spanish Physician on Posture in Labor..... 643
A New Base in Tea..... 643
The Detection of Saccharin..... 644
Ricin, a Toxic Ferment contained in Castor-Oil Seeds..... 645
The Toxic Dose of Oil of Gaultheria.... 646
Some New Facts in Relation to Hyoscyamine..... 646
A New Surgical Soap..... 646
Apiol and Isapiol..... 647
Antipyrin in suppressing the Milk-Secretion..... 647
The Treatment of Hemorrhage in Fibro-Myomata by Hydrastis Canadensis... 647
The Neurosis of Heart-Disease..... 648
Tribrom-Phenol..... 648
Cocaine in the Surgical Treatment of Hydrocele..... 648
The Diagnosis during Labor of the Twisting of the Cord round the Neck of the Fœtus..... 648
Mississippi Valley Medical Association. 648

Original Communications.

PROPHYLACTIC HYGIENE.

GENERAL CONSIDERATIONS ON THE MICROBE DOCTRINE.*

By Professor Dujardin-Beaumetz, Paris, France.

GENTLEMEN:—My last year's course of lectures was devoted to hygienic therapeutics, one department of which (alimentary hygiene) had occupied us the year before. I intend now to complete the subject by a series of conferences on prophylactic hygiene. We shall then have successively reviewed during these three years all the resources which hygiene can furnish for the treatment and prevention of disease.

Prophylaxis has entered upon a new scientific route, and the basis of modern preventive medicine is two great discoveries,—that of the pathogenic micro-organisms, on the one hand, and, on the other, of the incessant production by the economy of toxic alkaloids, ptomaïnes and leucomaïnes. So, in order that you may well grasp the details into which I shall enter in the course of these lectures, I propose to study in a general manner these pathogenic microbes and toxic alkaloids; and when once these data have been mastered, we shall see what we are to under-

* Advance sheets of a lecture delivered in Cochin Hospital; prepared for the Therapeutic Gazette by E. P. Hurd, M.D.

stand to-day by the words *infection* and *toxæmia*, and I shall endeavor to show that if infection is the result of pathogenic microbes, toxæmia is due to the presence in too great quantity of ptomaïnes and leucomaïnes.

But, before going farther, it will be well to take a glance at the progress which has been made in therapeutics and hygiene by the discoveries of Pasteur, and I shall devote the present lecture to certain general considerations on the microbe doctrine.

Of all the important discoveries of our illustrious countryman, none have been more useful than those which find their application in the domain of hygiene and medicine, and by the sole fact of these discoveries, Pasteur ought to be considered as one of the men that have done the most for humanity, and his name ought, in my estimation, to be placed far above that of Jenner, for, if the latter became a benefactor by a happy accident of genius, Pasteur, by the aggregate of his discoveries, has found a method of genius.

Writers have defined health and disease in widely-different ways, and these definitions have reflected the dominant notions of the divers medical schools from which they have emanated. Spiritualist and dynamist have given us definitions, and these definitions have become iatro-chemic with the vitalists, solidist with the organicists, and organo-vitalist with the eclectics. I would not presume to add another definition to those which have already been given; but, in order that you may well grasp the part which the pathogenic micro-organisms play in the economy, it seems desirable for me to show you how in our day we are to understand the state of health.

Bichat, at the beginning of this century, by his immortal works, first brought serious discredit upon the doctrine of Barthez, who saw in disease only an affection of the vital principle. But it was the progress effected in histological studies a little later which the most tended to modify or overthrow this eminently vitalist theory. Histology showed us that we may reduce to a single unit, the cell, the living substance of our tissues; this cellular entity, which has a life of its own, its own mode of alimentation, its products of secretion and excretion, is found as the primary component of the lowest and most rudimentary, as of the highest organisms.

These living units, according to the happy comparison of Duclaux in his "Microbe et la Maladie," constitute by their aggregation a veritable empire, a reunion of cities more or less prosperous, having each its own independent existence, but demanding for its maintenance certain special conditions. Cells trained and organized, they require each a particular pabulum, which must be conveyed to them in due sufficiency by the numerous vessels, comparable to our roads and canals, which connect these cities together. It is necessary also that the excrementitious products of each one of them shall find a ready exit, and that a system of sewerage, if I may use the expression, shall conduct away the daily waste matters. They must also be in communication with each other, and be in due subordination to the central power which directs them; this internunciary rôle devolves on the nervous system, whose net-work represents, in the comparison which I have just made, the telegraphic wires of a great governmental organization.

Health is the result of the good functionment of each of these cities, of the harmony of the offices which each one contributes, of the reciprocal support which they all give to each other. Let us examine the circumstances which tend to break this harmony. First, it is the advanced age of the cells, and this empire, so strong and flourishing during the first years of life and in adult age, is destined to see its forces decline as the years roll on; then the periods of decay and decrepitude will make themselves felt, death will end the scene, and of this cellular empire once so strong there will remain naught but the mineral ingredients, vestiges of the greatness of the past, which may be likened to those monuments discovered by the explorer by laborious search, and which indicate by their presence that a great city or a great nation has once lived on that soil which to-day is a desert.

Under other circumstances, the food necessary for the life of these cells does not come to them in sufficient quantity, the channel by which they are conveyed being obliterated, and the community succumbs from inanition.

Or, it may be the excretory passages which are obstructed, and just as we see our large cities the prey to infection and disease from the faulty working of their sewers, so the economy is poisoned by the retention of excrementitious products.

Lastly, it may happen that certain of these communities shall break the compact which holds them together; they would fain live an independent life; their cells take on an abnormal development, and, being no longer obedient to the central power, they become a cause of enfeeblement or death to the entire

organism, as happens in the case of tumors of malignant nature.

This empire so well organized has on its frontiers numerous foes, which attack it incessantly. These enemies are barbarian tribes, which know of but one law,—the law of multiplication; they have an individual existence requiring but little for its support; these barbarian foes are the pathogenic microbes.

Let there now be the least fissure or solution of continuity at the surface, and these microbes penetrate the economy, and a few hours suffice, in some cases, for them to destroy this organism before so resistant. But it is not always so, and, fortunately, owing to the good organization of the economy in its entirety, owing also to the active surveillance which it exercises over all its frontiers, the invasion may be averted, or, if it does take place, the first intruders are rapidly expelled or destroyed.

Under certain circumstances, the resistance will give way in certain points, and then we see the micro-organisms occupy either temporarily or permanently certain parts of the territory. Thus colonized, the micro-organisms will strive to make new incursions upon the enemy's country, but if due defensive precautions are taken, if the new frontiers are well guarded, the infection will remain quite local, and it may even happen that the organism, having gained new supplies, and marshalled new forces for the combat, may drive out of its territory the barbarians who were occupying it. This is what happens in the case of many affections, such as tuberculosis, which may remain for years, or even for a lifetime, localized in one part of the body, and which may even end in recovery, the bacillary invasion never having been complete.

Under other circumstances, the incessant multiplication of micro-organisms, which has been one of the causes of the victory which they have obtained over the organism attacked by them, is also a cause of their decadence. At first, they find in the conquered territory abundant supplies of nutriment, but their ever-increasing number rapidly diminishes this fleeting prosperity; poverty and death soon smite them in their turn, and if the economy has still certain strongholds which are unimpaired, we shall see the state rebuilt from its ashes, and, after passing through various phases, regain the activity and vigor of former prosperous times. This is what happens in the case of infectious diseases, where recovery takes place after a time of variable length.

Lastly, sometimes in order successfully to combat the invading enemy, the economy may, so to speak, levy certain troops, and constitute what Legroux spiritedly calls a *cellular mobilization*, composed of units which are acquainted with the tactics of the invading enemy, and which, habituated by former attacks to the evil which would overcome them, resist the invasion, and expel the intruders from their borders. Metschnikoff has given to these special troops the name of *phagocytes*, and I shall tell you of the important rôle which has been ascribed to them in the immunity conferred by previous vaccinations, or previous attacks, of certain infectious or virulent diseases.

At other times the economy may call to its aid certain micro-organisms expert to combat the invading foe. This is what has been described under the name of *bacteriotherapy*. Cantani, Emmerich, and more recently Paulowski, have shown on what basis this new therapy may be established.

In this struggle which every day and every instant the economy sustains against the invading element, may therapeutics and hygiene interfere, and aid the organism in ridding itself of these foes which would compass its ruin? Most assuredly, and I hope to show you in the course of these lectures how active and useful may be the assistance we can render, and what a variety of means there are at our disposal.

But before going farther it seems necessary in this new warfare with the microbes to know well the enemy which you are going to attack, and therefore I propose in the second part of this lecture to sum up as briefly as possible the knowledge which we possess respecting the history and physiology, or rather the biology, of these micro-organisms.

An English physician who lived in the seventeenth century, Robert Boyle, who was one of the pioneers in the experimental and positive method, and who believed in subjecting all the phenomena of the physical world to analysis and experiment according to this method, thus expressed himself: "He that understands the nature of ferments and fermentations shall probably be much better able than he that ignores them to give a fair account of divers phenomena of certain diseases (as well fevers as others), which will, perhaps, never be understood without an insight into the doctrine of fermentations."

These memorable words find full confirmation in the history of the discovery of the micro-organisms. After his brilliant re-

searches into the nature of the acids, tartaric and para-tartaric, Pasteur, at the age of thirty-two years, was appointed dean of the faculty of sciences of Lille. In this country, where the production of alcohols is so important an industry, Pasteur thought that it would be profitable to his class to make fermentations the subject of his course.

The theory of Liebig was then in the ascendency, being held with hardly any dissent. According to Liebig and his school, a ferment is an albuminoid substance more or less altered, which acts by contact on liquid or solid substances and induces fermentation. These substances possess a special force called catalytic force, which enables them to act by the simple fact of their presence.

Cagniard de Latour had, indeed, observed that brewer's yeast was constituted by an organism which multiplied by budding, and he demanded, without, however, answering the question, if this vegetation were not in causal relation with fermentation. Liebig, while acknowledging the existence of these micro-organisms, insisted that if they played any part in fermentation, it was those portions that had ceased to live to which should be attributed these properties, which are common to all albuminoid substances in the process of decomposition.

Pasteur solved the problem, and showed that fermentation is in direct relation with the development of these organisms, and if you can prevent their reproduction, you arrest fermentation. He multiplied in various ways his demonstrative proofs, and sapped Liebig's theory from its foundation by producing fermentation in a mineral medium entirely destitute of albuminoid substances.

Then he penetrated deeper into the question, and showed the wide extent of this study by bringing to view the fact that every fermentation has its special organism. Thus it was that he discovered the acetic fermentation, the ferment of lactic acid, then that of butyric acid, discoveries which were destined to be followed by others still more important. The mode of existence of the butyric ferment, the *bacillus amylobacter*, in fact, showed to Pasteur that certain of these organisms may live without air and constitute an exception to the law which was believed to be general that every living thing has need of free oxygen, and this enabled him to establish that important distinction between *aërobic microbes*, or those that live in the air, and *anaërobic microbes*, or such as live without air.

The lactic and butyric fermentations are produced by organisms having an appearance different from those of the alcoholic fermentation ; they constitute rods to which has been given the name of *bacilli* and *bacteria*,—the *bacillus lacticus* being the lactic ferment, and the *bacillus amylobacter* being the butyric ferment. It is the similarity existing between these micro-organisms of the lactic and butyric fermentations and those which Devaine had discovered in the blood of splenic fever (*charbon*) that led Pasteur to pass from the domain of fermentations to that of disease, and undertake inquiries into the nature of certain infections.

These micro-organisms, the causes of the fermentations of which Pasteur had been studying the culture and mode of development, so as to regulate these fermentative processes and exclude from the culture medium other organisms which determine vicious fermentations, live in a similar fashion to the plants of higher organization ; and just as the beet, for instance, derives from its root the elements which serve for the development of its leaves and its stalk, so these micro-organisms live by abstracting from liquids with which they are in contact certain elements proper for their existence, and thus transform sugar into alcohol, alcohol into vinegar, urea into ammonium carbonate, etc.

Two important discoveries followed these first researches,—on the one hand, the demonstration of the identity of putrefaction and fermentation, and, on the other, the solution of the great question of spontaneous generation.

These micro-organisms, factors of fermentation, are also the factors of putrefaction. When life has ceased in living organisms, it gives place to another kind of life ; the body is invaded by microbes, aërobic and anaërobic, which give rise to successive generations, bringing about little by little the combustion of the entire organism ; and it is just as Hameau expressed himself years ago :

> "Partout la vie est dans la vie,
> Et partout la vie dévore la vie." *

Of all this complex organization there remain only the spores or germs of the micro-organisms that have brought about this destruction and putrefaction, spores and germs which remain in a latent state till they find a new soil favorable for their work of destruc-

* Life is everywhere in life,
And life is everywhere devoured by life.

tion and combustion. As is well said by the author of a fine book, entitled "*Histoire d'un savant, racontée par un ignorant*," and which I would fain see in everybody's hands, these micro-organisms are the masters of the world, and if by any means you could suppress them, the surface of the globe would become uninhabitable.

The question of spontaneous generation was solved with the same scientific rigorousness which had been applied to the question of fermentations. The strangest notions prevailed in regard to spontaneous generation, and the world came near adopting the view of Von Helmont, the celebrated Louvain professor, who had given a formula for the spontaneous production of mice: "Take a dirty shirt, put in it some grains of wheat, subject the whole to heat, and at the end of a certain time there will be a transmutation of the wheat into mice." If for the higher animals these notions had been found to be erroneous, it was not so with the inferior organisms, and, notwithstanding the interesting experiments made in 1668 by one of the physicians of the grand duke of Tuscany, Francesco Redi, who showed that the maggots which develop in meat during putrefaction come in reality from the larvæ of flies deposited there, the scientific world was still disposed to admit spontaneous generation.

Pouchet, then director of the Museum of Natural History of Rouen, published in 1859 a book on "Heterogenesis," which was an eloquent pleader for spontaneous generation, which he supposed that he had proved by irrefutable experiments. In these researches theory had gone ahead of experimental demonstration, for, in his preface, this writer thus expresses himself: "When by meditation it was evident to me that spontaneous generation was certainly one of the means which nature employs for the production of living beings, I set myself about to discover by what processes I might succeed in demonstrating these phenomena." This was the crucial experiment of Pouchet:

Into a bell-jar placed over a mercury-bath he introduced oxygen, then nitrogen, so as to constitute an artificial air; then he took some hay which he had subjected in a stove to the temperature of 110°, and even 200° C., and introduced it into the bell-jar through the mercury; and in due time micro-organisms were seen to develop in great numbers on the hay. What was there to object to in such an experiment as this?

Pasteur showed in what way this so-called irrefutable experiment was at fault, and he brought to light the fact that it was the mercury which contained the germs of these micro-organisms, the cause of the apparent spontaneous generation, and that it was in passing through the mercury that the hay acquired these germs. He first varied in a multitude of ways his experiments, at each session of the Academy of Sciences replying to objections, and so far triumphed over his opponents, that to-day it is admitted without dispute there that there is no such thing as spontaneous generation. This germ theory, which, in his turn, Tyndall in England had confirmed by his ingenious experiments performed by the aid of sunbeams made to traverse closed apartments, had marked results, for it not only demolished an error in the department of natural sciences, but a doctrine fruitful in its applications to medicine was destined to originate therefrom.

The moment had come when Pasteur was destined to pass (according to the prescience of Boyle) from the domain of fermentations to that of pathology. Already the germ theory, to which he had given support by his celebrated experiments, had become a beacon-light to surgery; the last assault which had been made by the heterogenesists, with Pouchet in France at their head, and Bastian in England, had been repulsed, and then for the first time we saw, founded entirely on these new doctrines, the cotton-wool dressings of our great surgical chief, Alphonse Guérin, and the brilliant antiseptic achievements of Lister; and then began that revolution which was destined to transform modern surgery, and make it successful in ways unknown and undreamed of before.

It was *charbon*, or malignant anthrax (splenic fever), which served as the link between the study of fermentations and that of diseases, and this bond of union was due to a discovery made by Davaine and Rayer. Davaine wrote these words in a communication made to the Society of Biology in 1860:

"I have found in the blood of animals which died of charbon little filiform bodies having about twice the length of blood-corpuscles."

The similarity between these little filiform bodies and those which Pasteur had discovered, 1857–60, as the agents of the lactic and butyric fermentation, led Davaine to study anew this question in 1863, and he then asked himself if these little micro-organisms did not play the same rôle as these ferments, and if their development was

not the cause of the death of the animal? The demonstration was evident to him, and he endeavored to show that the bacterium was the essential cause of the disease. Pasteur then applied to this organism, so similar to the lactic and butyric ferments, the processes of culture which he had put in usage for the study of these ferments, and by means of this method he demonstrated in an irrefutable manner the rôle of this bacterium, the essential cause of the disease, and he not only indicated the mechanism of the death caused by this bacterium, but also the channels by which the contagion of charbon penetrates the organism. All these communications, which were subsequent to 1877, were made with the collaboration of Pasteur's assistants,—Joubert, Chamberland, and Roux. Pasteur's attack of apoplexy in 1868 made him dependent on such collaboration.

From this epoch, discoveries having an important bearing on medicine succeeded each other rapidly. Pasteur, after having demonstrated the existence of the anthrax bacillus, next discovered the microbe of septicæmia, then that of a disease which was making ravages among the poultry, and was described under the name of *chicken cholera*. This last discovery was destined to give origin to another much more important discovery,—that of attenuated virus.

Signalized by a veterinary of Upper Alsace, Moritz, and in 1878 by Péroncito, detected also by Touissant in 1879, the micro-organism of fowl cholera was cultivated by Pasteur in chicken broth. By means of these cultures, which enabled Pasteur to isolate the germ of the disease from other micro-organisms, he showed that when these cultures have been carried through many successive generations, instead of causing the death of the animal, they give rise to an affection of transient duration; but he also found that the fowls thus inoculated are, by virtue of the milder disease, exempt from further attacks of the malady, and resist inoculations made with a very virulent liquid. Thus, then, Pasteur had succeeded, according to the happy expression of Bouley, in domesticating these micro-organisms, and, thanks to this discovery, the micro-organism which is the virulent agent of the disease became cultivable, and the experimenter at his pleasure could either augment or diminish its virulence. This is, we may truly say, the greatest biological discovery of the age,—the discovery of attenuated virus; and it was amid the plaudits of the medical representatives of the whole world, gathered in London at the International Congress in 1881, that Pasteur uttered these words:

"I have given to the principle of vaccination an extension which science, I hope, will consecrate as an homage to the immense services rendered by one of England's greatest men,—Edward Jenner."

Then Pasteur applied this same principle to the treatment of charbon, and it was on May 5, 1881, that there took place, three kilometres from Melun, at Pouïlly le Fort, the celebrated experiment which showed that henceforth, thanks to attenuated virus, the veterinary art was in possession of a method which could preserve the flocks from the terrible scourge which was every year ravaging them. The doctrine of attenuated virus was now a fact gained to science, and was destined to serve a little later as the basis of the antirabic inoculations.

Each of the links of this chain, which began with fermentations, to terminate with the application of attenuated virus, constitutes an indisputable progress, and it is with a sentiment of just patriotism that I have undertaken to set forth this summary of these admirable discoveries. Before finishing, I must cast a general glance over those micro-organisms which play so important a rôle in pathology, and which Dr. Dubief, in his course of lectures, will, for your edification, take up in a more thorough and systematic manner.

These micro-organisms, these barbarians, as we have called them, which beset us on every side, present themselves under different forms to-day well known, and of which the natural history has been very completely studied. We have, first, then, those little spherical bodies to which has been given the name of *micrococcus*, then those more elongated bodies which have been described under the name of *bacteria*, *bacilli*, or *spirilla*, if their size is still greater. However, the morphology of these micro-organisms has only a secondary importance in the question before us. The recent experiments of Charrin with reference to a microbe which is found in colored pus, the microbe of pyoscyanine, show that by modifying the culture-broth, you not only modify the secretion of the coloring-matter by the microbe, but also its form, and, according to the liquid added to this culture-broth, you see this form vary. While with boric acid you obtain straight, elongated filaments, with other substances you obtain spirilla, or crescent-shaped or comma-shaped bacilli, very short rods, and even micrococci.

This interesting experiment shows how marked a feature of these microbes is polymorphism.

These micrococci, bacteria, bacilli, multiply with extreme rapidity; and, to give you an idea of how prolific they are, I will cite a passage from Duclaux's book, in which he refers to some experiments of Cohn:

"Certain bacteria, in undergoing segmentation, produce in three days' time four billions seven hundred and seventy-two millions of living beings to each individual. At the end of twenty-four hours the offspring of one bacterium will weigh the fiftieth of a milligramme, but at the end of three days it will weigh seven thousand five hundred tons,—that is to say, would of itself fill one of those immense transatlantic ships which are the pride of our navigation."

The propagation of these micro-organisms is effected in different ways. Sometimes it is by scissiparity (fission); the rods divide into two or more rings, and this generation by scission has led botanists to give to these microbes the name of *schizomycetes*, or of *schizophytes*, from a Greek word meaning to cleave or split. They have also given to these schizomycetes, of which each one of the parts, on being detached, becomes the starting-point of a new colony, the name of *arthrospores*. Sometimes they multiply by sporulation, and then we see develop, in the interior of the bacilli, spores, which become free when the wall of the bacterium bursts; these are *endospores*. Then these spores, if they find a favorable medium for their development, give rise to new bacteria. It is these spores or germs which offer the most resistance to our most energetic means of destruction.

Each one of these micro-organisms, like every living cell, has need of special conditions in order to live, and, for its full development, must find a favorable culture medium, which varies according to the microbe under observation, and it suffices to raise or depress the temperature of this medium to cause the micro-organism to develop or cease to develop, and I know of no better example to cite in this regard than the curious experiments of Pasteur on the bacillus anthracis. For the development of this bacterium a mean temperature is required; if it is too high, the microbe succumbs; this it is that explains why it is that fowls, whose animal heat is higher than that of sheep, are rebellious to charbon. So, if you take a hen and inoculate it with anthrax bacilli, it will resist this inoculation; but if you place it in a refrigerant medium, in cold water, for instance, it will take the infection and succumb.

The experiments of Raulin go to show how much the culture soil may be modified by really slight conditions. Raulin operated on those mould fungi which grow so readily in acid media, slices of lemon, for instance, special mycoderms, to which has been given the name of *aspergillus niger*. He created a culture medium essentially mineral, containing numerous substances, to the sum of which has been given the name of *Raulin's liquid*, and of which the composition is as follows in grammes:

Water	1500.00
Sugar candy	70.00
Tartaric acid	4.00
Ammonium nitrate	4.00
Ammonium phosphate	0.60
Carbonate of potassium	0.60
Carbonate of magnesium	0.40
Ammonium sulphate	0.25
Zinc sulphate	0.07
Sulphate of iron	0.07
Silicate of potassium	0.07

You have only to modify one of the elements of this culture medium in order to enfeeble the production of the aspergillus niger, and cause it to disappear. Thus, the suppression of the potash reduces the production by one-twenty-fifth, that of the zinc by one-tenth. But this is not all. When you add to this mixture other substances, such as nitrate of silver, and in even the incredible proportion of 1 to 1,600,000, the production ceases immediately. But what is still more astonishing, under conditions where chemists find themselves unable to detect the least traces of this metal, the liquid yet becomes unfit for the culture by the sole fact of being in contact with a silver vessel.

If we were to consider the aspergillus niger as a pathogenic bacterium, and were to base ourselves on the foregoing figures, all that we should need, in order completely to destroy this mucedo in the body of a man weighing sixty kilogrammes (about one hundred and twenty-five pounds), would be 60 milligrammes (1 grain) of nitrate of silver; and if this bacterium should develop only in the blood, a dose of 5 milligrammes ($\frac{1}{12}$ grain) would be sufficient.

These micro-organisms, which, as we have just seen, develop with such extreme rapidity by budding, by segmentation, by sporulation, fabricate, like every living cell, excrementitious products more or less toxic. To these *leucomaïnes* a capital importance has been at-

tributed, and the opponents of the microbe doctrines have affirmed this proposition: that the microbe is nothing, and that the leucomaïne produced by the microbe has the preponderant rôle in the production of the morbid phenomena. We shall have to return to this point in one of our future lectures.

The number of newly-discovered pathogenic microbes increases from day to day, but it is not enough to find a micro-organism in a sick person to justify one in attributing to such micro-organism a pathogenic action; you must be able to isolate it; you must, moreover, by a special culture, reproduce and perpetuate it; and, finally, by inoculating the product of your cultures in animals or in man, you must be able always to reproduce the identical symptomatic aggregate which you found in your first patient. You will see how difficult often is the realization of these three conditions.

However it may be with respect to these reservations, this question of microbiology to-day forces itself upon all intelligent observers; in the scientific circles of Europe and of the entire world it is the theme of earnest attention and study; the means of culture, and the scientific processes which enable us to observe and isolate these micro-organisms are being perfected every day. Under the influence of such studies our medical doctrines are profoundly modified, and the words *contagion*, *epidemicity*, *virulence*, *prophylaxis*, have taken on a new meaning. It seems to me that the moment has come for hygienic therapeutics in its turn to profit by researches of this nature. Thanks to the help given me by my laboratory chief, Dubief, to whom we are indebted for quite a useful manual of microbiology,* I have been able to provide my therapeutic laboratory with all the implements and apparatus needed for carrying on researches of this kind. Therefore, relying, on the one hand, on the labors of my predecessors, and, on the other, on those of Dr. Dubief, which you will be likely yourselves to witness, I propose to study in the chapters which shall follow this most interesting question of the bacteriological doctrines in their application to prophylactic hygiene. But, before entering upon the main part of my subject, I must devote several lectures to the study of pathogenic microbes and of ptomaïnes. This is what I shall do in my next lectures.

The ardor with which these new microbiologic studies are pursued results in the discovery almost every day of new pathogenic microbes. In the eloquent discourse delivered last year before the Medical Congress of Washington by my excellent friend, Senator Semmola, "On Scientific Medicine and Bacteriology," the eminent professor of Naples complains of this multiplicity of new microbes, and of this invasion of medicine by microbiology, and, in the name of the experimental method, he condemns these researches as overhasty and excessive. I cannot sympathize with this rigorousness. Certainly, the future will do justice to these incessant discoveries of all the experimenters who have entered upon the way which Pasteur has opened up for them. It will accept some and reject others; but you must not abate or discourage the ardor of these laborious workers, for the field which they cultivate is so vast and so fertile that all may find a place there.

For my part, it is not without a profound sentiment of patriotic admiration that I contemplate the advance which has been made during the past ten years, from the moment when, April 30, 1877, our illustrious countryman read before the Academy of Sciences his memoir on the anthrax-bacillus.

I particularize this date because it has been asserted that these microbic doctrines have a much older origin. This, gentlemen, is a mistake which must be met. Parasitism, as it was understood in the old medical doctrines, has nothing in common with the study of pathogenic microbes, and the claims which Raspail has set up in behalf of his father ought to be absolutely repudiated in the name of scientific medicine.

The doctrine of the elder Raspail, if we may give this name to that congeries of assertions, more or less strange and incoordinate, respecting the causation of diseases, and in which we see diseases such as typhoid fever, smallpox, measles, scarlatina, etc., determined by the influence of comets, gives to parasitism a quite different meaning from that now understood, as you can judge from the following passage, in which the celebrated revolutionist attributes to diseases as causes, "the external or internal parasitism of aquatic ova, of worms, of larvæ, of flies, of mites, of caterpillars, of perfect insects (lice, fleas, bugs, beetles); lastly, of helminthi, or intestinal worms, which seize upon man in the cradle, and often do not abandon him till the tomb shuts him in, to be a prey to worms more

* Dubief, "Manual de Microbiologie." Paris, 1888.

fierce and ravenous than themselves;" and he takes care to add, *à propos* of physicians, not being himself a physician, this complimentary remark: "Among the most harmful parasites, I ought to mention, if it may not displease you, the mischievous practitioner, who afflicts you without knowing why; his pricks (unlike those of insects) may be and often are mortal, and he is allowed to go scot free."* We are, as you see, far from getting even a glimpse here of the microbe doctrines of which I have just been speaking.

If we were to assign any priority to the advocacy of this doctrine of the living germs of virus, we should attribute it to Jean Hameau, of La Teste. In a curious work, "On Viruses," published in 1847, and which sums up experiments undertaken since 1836,† Hameau expresses himself thus: "Every heterogeneous matter which may find admission into a living body, and may there remain passively, multiply, and then obtain an exit, to act in the same way in another living body, seems to me to have a principle of life."

Then, as at this epoch microscopical science was in its infancy, Hameau compares the different kinds of virus to the organism which appears to him as the most minute, viz., the itch insect, and he considers the multiplication of viruses as like that of these little mites. Lastly, he makes clear his idea in the following words: "Viruses have germs which reproduce themselves."

It is a stupid thing to remark, as some have done, that medicine does not make any progress, and that, while surgery every day effects new conquests, medicine lags behind. We may reply to these defamers of our art, whose ignorance is their only excuse, by facts which cannot be gainsaid. Show them the virulent and contagious principle of diseases, isolated, cultivated, domesticated; show them vaccine enlarging by attenuated viruses the field of its preservative action, protecting our flocks from the deadly epizoöty, and reducing to a very low death-rate a disease heretofore regarded as incurable,—canine rabies; show them, moreover, the hygiene and prophylaxis of diseases based henceforth on precise and exact data, and antisepsis, already struggling to effect the transit from the domain of surgery to that of medicine, and let them know that we owe all this progress to these new studies. Hence it is that I am ready to exclaim, as did lately Bouley at one of our academic reunions, "A new doctrine is opening before medicine, and this doctrine seems to me powerful and luminous. A great future is in preparation; I wait for it with the confidence of a believer and the zeal of an enthusiast."

* F. V. Raspail, "Manuel Annuaire de la Santé pour 1881." Paris, 1881, p. 15.

† Hameau, "Étude sur les Virus" (*Revue Méd.*, November and December, 1847).

ARSENIC IN LEUCOCYTHÆMIA.

By E. A. Barton, M.R.C.S. and R.C.P., London, W. C.

THE use of arsenic in leucocythæmia has been recognized, but no minute observations on the blood of a patient suffering from leucocythæmia under the influence of arsenic have been made. Professor Osler suggests that arsenic should be given a trial, and is often of service, though he does not mention any analysis of the blood in such cases. He has often seen marked improvement without any treatment at all.

In the following case the patient had his dinner at twelve, mid-day, the observations being made at four, just before another meal.

I am indebted to Dr. Ringer, under whose care he was, for permission to publish the following case:

J. S., a gardener, was admitted into the University College Hospital on February 13 complaining of tumor in the belly, with wasting.

His history briefly was this: He had lived at Gravesend, and at the age of twelve went to Charlton, where he had an attack of ague. He says the ague fits returned every other day, and lasted for three months. He has since lived in Hampshire and at Ealing. For the last year he has lived near Windsor on the Thames.

Ten months before admission he noticed that he was growing stouter, but getting weaker. The belly was not tender till three months before admission. He became troubled with piles, and had several attacks of epistaxis.

On admission he was thin and pale, the spleen was enormously enlarged, reaching from the spine to an inch to the right of the middle line in front below the umbilicus. The umbilicus was somewhat everted, and four fingers could be placed in the notch of the spleen. The lower limit of the spleen extended to one inch above Poupart's ligament. There was marked tenderness over

the front of the sternum, though there was none in any other bones. No enlarged glands were found. The lungs were healthy. A mitral systolic murmur was heard over the apex of the heart and a pulmonary murmur at the base. The arteries were fibroid. There was slight fever present, the highest temperature during the day being about 100° F.

On the 20th of February the blood on examination showed thirty-eight per cent. of red corpuscles, and 1 white to 2.5 red. He was put on liq. arsenicalis, ♏v, with quinine, gr. iii, three times a day, but, after two days, the quinine was discontinued, and liq. arsenicalis, ♏x, was given three times a day, the red corpuscles at this time being thirty-nine per cent., with 1 white to 2.7 red. The arsenic was quickly pushed to ♏xv four times a day, and gradually pushed to toleration point, till, on March 10, he was taking ♏xxv four times a day, or nearly a grain of arsenious acid. This dose was only given for five days, when diarrhœa set in, and the arsenic was discontinued. The blood at this time showed fifty-five per cent. of red corpuscles, with 1 white to 20 red. It was impossible till this time to estimate correctly the quantity of hæmoglobin, as the turbidity caused by the white corpuscles interfered with the comparison of color; but, on March 17, the hæmoglobin was found to be forty per cent. The spleen at this time was markedly smaller, about two-thirds its original size, and much harder, and all tenderness had disappeared. The temperature also became normal. On March 17 a boil developed on the upper lip, and the following day this became a carbuncle. The next day an attack of facial erysipelas came on, starting from the carbuncle, lasting six days. His temperature ran up to 104.2° on the first day, and kept up to about 103° for a few days, but fell to normal on the 23d. The arsenic had been discontinued since the 15th, and during the attack of erysipelas he was put on tr. ferri perchlor., ♏x, every hour. During the attack his red corpuscles remained comparatively high, averaging about sixty-six per cent., but no sooner was the arsenic discontinued than a steady increase was noticed in the number of white corpuscles. He had thoroughly recovered by the 24th, when the tr. ferri was discontinued, and 5 grains of the sulphate of iron was given three times a day.

On April 5 a crop of carbuncles appeared on the perineum, some of which were opened. He lost much blood at his daily stool,—about half a teacupful at a time. A good deal of suppuration ensued in two of them. These were treated with fomentations and iodoform, and they gradually disappeared, leaving him at the end of a fortnight much reduced in health. The iron was discontinued during the attack, and ¼ gr. of sulphide of calcium was given four times a day. During the attack of carbuncles the red corpuscles fell from sixty to fifty per cent., the hæmoglobin remaining about the same. The white corpuscles had been increasing in number since the discontinuance of the arsenic, till, on April 11, they stood at 1 white to 9 red.

The spleen also had become larger, nearly to its original size, and was very tender. He was again placed on arsenic, commencing with ♏xv of liquor arsenicalis, four times a day, which was quickly pushed to ♏xxiii four times a day. In three weeks his white cells became normal in quantity relative to the red, 1 white to 300 to 400 red, the latter remaining stationary till a small dose of ferri sulph., gr. ii, four times a day, was taken with the arsenic, when the red corpuscles were temporarily increased.

As a result of the administration of arsenic in such large doses, the skin was found to be growing darker, until he became quite bronzed, the pigmentation being more marked over the belly, and gradually fading over the chest. The pigmentation was especially intense over the bony prominences, notably the tuber ischii, and the prominences of the scapulæ, being composed of minute points, chiefly confined to the prominences of the hair-follicles.

On April 29 gr. v of ferrum redact. was given with the arsenic till May 3, when some vomiting, diarrhœa, and great loss of appetite necessitated the discontinuance of the arsenic, the patient taking the iron only. The spleen was much reduced in size, and was much harder; it had also lost the tenderness which was present before the arsenic was readministered. The hæmoglobin was scarcely altered in quantity from the time of admission. He left the hospital on May 7.

When he left the hospital his white corpuscles were normal in quantity relative to the red, 1 to about 350 red. The hæmoglobin was deficient (twenty-five to thirty per cent.) in quantity and per corpuscle, the blood in this respect differing from that in pernicious anæmia, in which, although there is great deficiency in the number of red corpuscles, the quantity of hæmoglobin is normal per corpuscle. Nor had he much improved in health, being nearly as weak as when he came in.

His weight was the same as when admitted. It is difficult to say whether the persistence of the disease, or the attack of carbuncles, with their accompanying hemorrhage, was the main factor in reducing him to such a condition of weakness. If the debility were the result of the persistence of the disease, it must have been due rather to the deficiency of red corpuscles and hæmoglobin than the relative quantity of white to red cells, for, on his discharge, there was no discrepancy in their relative proportions. No doubt the debilitating effects of the carbuncles played a large part in reducing him, as was evidenced by the progressive drop in the number of red corpuscles during the attack, though this reduction may have been due to the hemorrhage. It is uncertain whether the carbuncles may not have been induced by the exhibition of such large doses of arsenic, but certain it is that the predisposition to hemorrhage, so prominent in cases of leucocythæmia, tended to increase the losses of blood from the carbuncles.

On admission the blood contained thirty-eight per cent. of red corpuscles, with 1 white to 2.5 red; on his discharge it contained forty-six per cent. of red corpuscles, with 1 white to 400 red. Gamgee states that the number of white corpuscles after a meal is double that while fasting, and that this is not a progressive rise, but is at its maximum half an hour after meals, his numbers being 1 to 716 in the morning fasting state against 1 to 347 half an hour after breakfast. To observe whether this fact held good in cases of leucocythæmia, where the white cells are themselves in excess, the man had no meal from 5 P.M. to 9 A.M. the next day, when he had a large breakfast. The number of corpuscles were thus:

8.00 A.M., fifty per cent. red, 1 white to 4 red.
8.30 A.M., forty-seven per cent. red, 1 white to 4.5 red.
9.00 A.M., forty-nine per cent. red, 1 white to 4.3 red.
Breakfast. 9.30 A.M., forty-three per cent. red, 1 white to 3.3 red.
10.00 A.M., fifty-one per cent. red, 1 white to 2.4 red.
11.00 A.M., fifty-two per cent. red, 1 white to 3.7 red.

The nine o'clock observation was made just before the meal, showing 1 white to 4.3 red; that at ten o'clock, just half an hour after the meal, showing 1 white to 2.4 red, or nearly double.

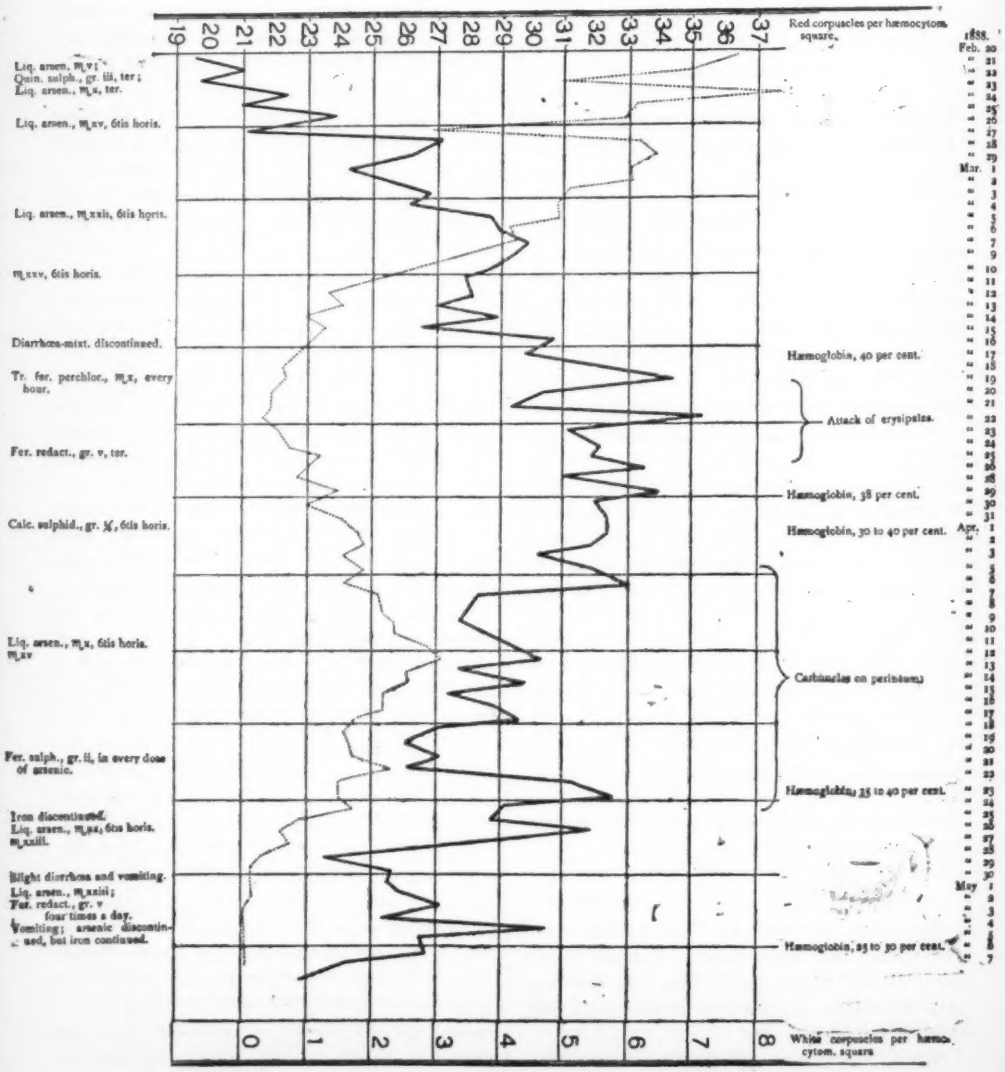
Some observers noticed that the movements of the white corpuscles in leucocythæmia on the warm stage were deficient, while others maintained that their activity was normal. His corpuscles were examined on the warm stage at a temperature of a little over 90° F., and the movements appeared to be as active as in the white cells of normal blood.

TEMPERATURE CHART.

		Maximum per day.
February	13	100.2°
"	14	100.4°
"	15	100.2°
"	16	100.2°
"	17	100.2°
"	18	100.6°
"	19	100.2°
"	20	99.2°
"	21	100.8°
"	22	100.6°
"	23	100.6°
"	24	100.4°
"	25	99°
"	26	100.4°
"	27	100°
"	28	100°
"	29	99.4°
March	1	99°
"	2	99°
"	3	98.8°
"	4	98.4°
"	5	99.2°
"	6	99°
"	7	99°
"	8	98.2°
"	9	99.2°
"	10	99°
"	11	99°
"	12	99°
"	13	98°
"	14	100.4°
"	15	99.6°
"	16	98.4°
"	17	100.4°
"	18	99.4°
"	19	104.2°
"	20	103°
"	21	103.4°
"	22	102.3°
"	23	98.4°
"	24	97.4°
"	25	97.8°
"	26	97.6°
"	27	97.4°
"	28	99°
"	29	99°
"	30	99.2°
"	31	98.6°
April	1	98.8°
"	2	99.2°
"	3	99.4°
"	4	100.4°
"	5	100°
"	6	99.4°
"	7	100°

	Maximum per day.
April 8	100°
" 9	100°
" 10	100°
" 11	98.8°
" 12	100.2°
" 13	100.4°
" 14	99.8°
" 15	100°
" 16	99 2°
" 17	99.4°
" 18	99.8°
" 19	99.8°
" 20	98.6°
" 21	98.8°
" 22	99.2°
" 23	100.2°

	Maximum per day.
April 24	100°
" 25	100.2°
" 26	99°
" 27	99.2°
" 28	99.2°
" 29	98.8°
" 30	99.2°
May 1	98.6°
" 2	98°
" 3	98.6°
" 4	98.2°
" 5	98.2°
" 6	98.4°
" 7	99.4°
" 8	98.4°


Red corpuscles per hæmocytom. square.
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
1888.
Feb. Mar. Apr. May
Liq. arsen. ♏v; Quin. sulph., gr. iii, ter; Liq. arsen., ♏x, ter.
Liq. arsen., ♏xv, 6tis horis.
Liq. arsen., ♏xxii, 6tis horis.
♏xxv, 6tis horis.
Diarrhœa-mixt. discontinued.
Tr. fer. perchlor., ♏x, every hour.
Fer. redact., gr. v, ter.
Calc. sulphid., gr. ½, 6tis horis.
Liq. arsen., ♏x, 6tis horis. ♏xv
Fer. sulph., gr. ii, in every dose of arsenic.
Iron discontinued. Liq. arsen., ♏xx, 6tis horis. ♏xxiii.
Slight diarrhœa and vomiting. Liq. arsen., ♏xxiii; Fer. redact., gr. v four times a day.
Vomiting; arsenic discontinued, but iron continued.
Hæmoglobin, 40 per cent.
Attack of erysipelas.
Hæmoglobin, 38 per cent.
Hæmoglobin, 30 to 40 per cent.
Carbuncles on perinæum.
Hæmoglobin, 35 to 40 per cent.
Hæmoglobin, 25 to 30 per cent.
0 1 2 3 4 5 6 7 8
White corpuscles per hæmocytom. square

EXPLANATION OF CHART.

The black line in the chart is the record of the red corpuscles per hæmocytometer square. Normal blood has fifty corpuscles to the square.

The dotted line indicates the variations of the white corpuscles per hæmocytometer square. In normal blood there is, on the average, 1 white cell to about 8 to 10 squares,—that is, 1 to 400 to 500 red.

The dates of observation are at the top of the chart, and below are a record of the drugs and their doses given. The observations were made at 4 P.M. every afternoon, just before his meal.

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THERAPEUTICS OF INFLAMMATORY MASTOID DISEASE.

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THERE are, I believe, few diseases so subject to ignorance and misconception, or so generally at the mercy of empiricism and superstition, as chronic mastoiditis. The reason is twofold: First, the subject receives but scant attention at the hands of teachers that are not specialists, and, consequently, is ignored by the student. Second, the pretensions of practitioners, not also aurists, are such, for the most part, that "earaches" and "ear discharges" are relegated to the care of ancient beldams who seek notoriety as dabblers in physic. Many medical men to this hour, when consulted regarding a chronic otorrhœa, treat it as a *nolle me tangere*, or, perhaps, declare any attempt at alleviation futile, and alike a waste of time and capital; and this is only one of many leaves from the "Book of Errors," and owes its origin, doubtless, to the fact that long before mastoid inflammation was differentiated as a disease *per se*, grave cerebral troubles were observed to supervene upon cessation of chronic aural discharge—the danger arising from damming the purulent secretion within the ear cavity was recognized, but not understood, and proper methods, looking to relief, owing to deficient physiology and pathology, had not been developed.

Commonly, all affections of the auditory apparatus are relegated to the domain of *otitis* or *otalgia*, terms that at best are vacuous, the one being indefinite, the other expressive only of a symptom that is invariably relative and subjective.

Subdividing aural inflammations according to seat and origin, we have *otitis externa*, *o. media*, *o. interna*, and *o. cellulosa*, the latter alone possessing interest in this connection.

Otitis cellulosa acuta is a condition that never has been, and probably never will be, successfully differentiated (except, perhaps, as a sequel to traumatism), since it is self-limited and intimately associated with, and dependent upon, *o. media* or *o. media et interna*. *O. cellulosa chronica*, however, constitutes a form of true mastoiditis.

All phases of simple otic inflammation, like most acute conditions that do not merge into the chronic form, are of brief course and duration, and circumscribed in area and locality. They are relieved by spontaneous absorption or resolution; may or may not be accompanied by otalgia and suppuration; and the products of inflammation seek outlet by the simplest routes, either through the *meatus auditorius externus*, or *via* the *tuba Eustachiana* and posterior pharynx, in the latter instance being often confounded with catarrhal affections. *Vice versa*, catarrhal disorders may procure *otitis media*, that in turn culminate in mastoiditis.

A visible otorrhœa, as the sequel of chronic otitis, should always be regarded with suspicion. Here the old adage of an "ounce of prevention," etc., is sometimes of incalculable value. It may or may not have its origin within the mastoid process, yet, should the discharge prove especially offensive, saneous and curdy, at the same time manifesting a *cheesy* odor, the evidence is presumptive. Resort, in any event, must be had to the speculum, since, not infrequently, the most suspicious otorrhœas are developed from an *otitis externa* as sequels of impacted cerumen, or unsuspected or forgotten foreign bodies (including the hundred-and-one nostrums and panaceas placed within the meatus with a view to ameliorating "earache" and "toothache"); one intensely nauseating case that I recall had its origin in the "*roasted heart of a small onion!*" Any form of otitis, then, if neglected, may culminate in inflammatory mastoid disease, since the mucous lining of the mastoid antrum and of the pneumatic cells is but a proliferation of the membrane of the internal and middle ear.

Mastoid disease exhibits three different phases and two stages, viz.: 1. (A) Periostitis of the outer surface of the bone. 2. (A) Congestion and inflammation of the antrum and cells. 3. (B) Caries or necrosis, involving also the bones of the middle and internal

ear, inviting—if not already developed—*meningitis*, *cerebral abscess*, *thrombus* (of lateral sinus), and *pyæmia*.

External periostitis may arise from acute inflammation of the middle ear and consecutive inflammation of the external auditory canal. Congestion and inflammation of antrum and cells, as already noted, is the result of direct extension of *otitis media* and *o. media et interna*. Caries and necrosis may be a product of either of the foregoing, but is especially a sequel of the latter. Any one may develop, directly or indirectly, from purulent accumulations within the middle ear; and may assert itself abruptly and without warning, for there is no definite period of invasion, neither is there any phase of life exempt,—though, for reasons obvious, the young are more predisposed thereto, because of diseases of infancy, the *exanthemata* more especially.

Again, few cases present data for the evolvement of satisfactory history, since, by the patient, the period of prodroma is commonly ignored. It is not until long after the mischief is done, and when peculiar and unfamiliar symptoms are manifested, that the practitioner is consulted, and then, perhaps, for something as far removed from the truth as it is possible to imagine. Could the desired history be secured, however, doubtless it would be something as follows: Influenza, succeeded by *tinnitus aurum*, marked lassitude, and irritability; supposed "malarial" manifestations; and *dysecoia*, partial or complete, following a period of agonizing pain, culminating, perhaps, in suppuration and discharge, the latter presenting characteristics varied according to the length of time established and the tissues involved. The simplest cases to diagnose are those marked by sudden cessation of foul, blackened otorrhœas that have existed for considerable periods of time. And right here let me add that, in the rachitic and strumous, ear maladies almost invariably are mastoideal, and somewhat remarkable for absence of pain or acute suffering.

Not infrequently all evidences of inflammation have long subsided ere suppuration is established, so long as to escape the memory of the patient, who relegates the discharge to a supposed "cold in the head." Even febrile condition may be difficult to establish, pulse and thermometer alike failing to register definite disturbance of circulation or bodily heat, and that, too, at the very height of the malady. Usually, however, by visiting the sufferer at unaccustomed and unseemly hours, some slight exacerbation is detected, even though the increase of temperature is but a degree or degree and a half; and the temporal artery will sometimes present the irregularities that are vainly sought at the wrist. Here, again, the chief reliance must be a course of analogical reasoning, aided by mirror and speculum.

Mastoid pain, when present, is commonly so peculiar, and so severely acute, as to be pathognomonic; and once recognized is not apt to be again misunderstood. It not infrequently leads to delirium, and in children, when thus advanced, great care must be taken not to confound it with the manifestations of acute hydrocephalus and the so-called "hydrocephalic cry." As it radiates to the temporal, frontal, and occipital regions of the affected side, its exact seat or locality is with difficulty determined by either physician or patient, though critical investigation will probably reveal suspicious evidence in inability to swallow (amounting, perhaps, to spasm at the sight of fluids); in stiffness and rigidity of the muscles of neck and pharynx, including hard, prominent *sterno-cleido-mastoid;* and in enlarged lymphatic, maxillary, and sublingual glands. Should tumefaction and swelling, markedly sensitive to touch, be discovered immediately behind the ear and in the vicinity of the mastoid, suspicion becomes a practical certainty.

If not interfered with, the malady usually progresses swiftly. Symptoms of general debility, including anorexia, supervene, followed by emaciation,—a sequel of derangement of digestive organs and perversion of nutritive functions,—and the circulatory and nervous systems suffer accordingly. The countenance is sallow, drawn, and anxious; the nostrils and lips thin, pinched, uplifted,—the former waxen, the latter leaden; and unmistakable evidence is afforded of enfeebled vitality and weakened heart-function. Salivation may exist as a result of inability or disinclination to swallow, and also paralysis (more apparent than real, since sensation is rarely interfered with) of tongue and jaw. Finally, if relief is not obtained, caries and necrosis follow, leading to meningitis, thrombus, pyæmia, and death, which last often succeeds unexpectedly and suddenly.

All the foregoing are important evidences, yet, so capricious is the disease, that one and all may be "conspicuous only by absence." Often, too, they are most vague and undefined in character, demanding apt perception and

discrimination, though patient and careful investigation, aided by manipulation and exploration, will usually afford a clue that, properly followed, leads to certainty.

That so insidious a malady demands most careful attention in the details of care and treatment as well as diagnosis must be apparent, and that it cannot be safely meddled with by those not thoroughly conversant with its pathology and physiology is equally obvious. First, because of its exceeding gravity by reason of locality and relations to cerebral nerves and vessels, and the results that follow in its train, so frequently terminating fatally. Second, under the most favorable circumstances, if unaccompanied by expert treatment, a deaf and diseased ear must obtain, affording ample encouragement for a second onslaught. Before proceeding further, then, permit me to call more particular attention to the osseous relations.

Starting with the external auditory apparatus, observe at the meatus an annular leaf of bone, curved beneath, and cemented anteriorly to the *squamous*, and posteriorly to the *petrous*, portions of the temporal bone. Following the direction of the *meatus auditorius externus*, at its farther extremity is found the *membrana tympani*, blocking the way to the middle ear, and presenting the appearance of firm, somewhat elastic, translucent tissue, and with a slight downward and inward inclination, and forward at an angle of perhaps thirty-five degrees. Beyond, the apartment (tympanum) is more lofty than the meatus, and some three lines in depth by eight and one-half in antero-posterior diameter. Here, midway between the floor and ceiling, in the anterior wall, is the opening leading downward and inward to the posterior pharynx,—the Eustachian way. Near the centre of the farther wall and opposite the "drum" is the *promontory*, well defined by the lower turn of the *cochlea;* and above the *fenestra ovalis*, where terminate the polished system of minute levers and sound-transmitters, the *ossicles* (*malleus*, *incus* *stapes*, and *os orbiculare*), that form a chain across the cavity connecting the "drum" to the *vestibule*. Beyond the *fenestra ovalis*, in the inner ear, the opening of the *cochlea* and its spiral way appear, and farther back the *semicircular canals*. Coming back again to the middle ear, on the posterior wall is revealed an opening leading backward and upward to the chamber over the external meatus, the *antrum mastoideum*, and beyond, backward and downward, to the series of *pneumatic cells* or *mastoid spaces*, as they are indifferently termed; these cells may be many in number or but few. In the new-born the mastoid antrum alone exists, the inner table of the bone being incomplete and in a transitory stage of development; hence, the existence of the sense of hearing is, to say the least, problematical.

Turning now to the inner aspect of the *os temporis*, note upon the cerebral surface of the mastoid a groove curving round upon the posterior portion of the petrous bone for the reception of the *lateral sinus*. If an old and long-inhumed skull is at hand, evidences of erosion and decay will probably appear in this vicinity, demonstrating the extreme frailty, in spite of hard and solid aspect, of the osseous partition separating the *antrum mastoideum* from the middle lobe of the cerebrum. In the crania of young children, or infants, this partition is superficial, and not infrequently lacking (*meningosis*), hence discharges from the ear occurring coincidently with convalescence from maladies having no immediate reference to the auditory apparatus,—*meningitis*, etc. Note, also, in the groove of the lateral sinus, a foramen that transmits the *mastoid emmissary vein* from without through the external surface of the mastoid, traversing the pneumatic spaces on its way to form a junction with the sinus.

Again, I would call attention momentarily to the scalp surface of the mastoid, and to the delicate structure of the outer table of this bone directly over the pneumatic cells or spaces. It is here crushing power is sometimes applied with such serious and fatal results during brawls.

Caries and necrosis may appear: 1. In the external plate of the mastoid, including the posterior wall of the meatus. 2. In the inner wall of the middle ear, involving and destroying the *cochlea* and *semicircular canals;* Mr. Peter Crompton, of London, relates removing from the ear of a patient a mass of necrosed bone that comprehended the *whole* internal ear,—*vestibule*, *cochlea*, and *semicircular canals!* 3. In the tegmen or roof of the middle ear, and also in the *antrum mastoideum*, provoking meningeal inflammation, and perhaps abscess of the middle lobe of the cerebrum above. 4. In the inner plate of the mastoid, also resulting in meningitis, cerebral abscess, thrombus of lateral sinus, and resultant pyæmia. Or a phlebitis may extend from the mastoid cells along the mastoid emmissary vein, involving the lateral sinus, thereby incurring thrombus and ultimate fatality.

Some of the more rare occurrences—or *freaks*, perhaps—exhibited by mastoid disease are: Inflammation and congestion of eye and orbit of the affected side, that may or may not be accompanied by protrusion of the globe; cerebral abscess of the middle lobe at the *opposite* side of the head, as a sequel of reflex and sympathetic causes; and periosteal abscess midway between the mastoid process and the occipital protuberance.

In asthenic subjects, whether the condition is of long standing or merely a sequel of the disease itself, inflammation is equally prone to advance to caries or necrosis, with few manifestations of suffering,—perhaps none at all,—aside from constitutional derangement; indeed, the patient frequently presents himself for relief from a "generally run-down condition." Again, at intervals during progress, pain, if present, will suddenly subside or altogether disappear; and such subsidence is all the more unfortunate in that it tempts to a prognosis that sooner or later will be a cause of profound regret. Especially is this true where there is coincident abatement of tumefaction and swelling. As already suggested, febrile manifestations may be altogether wanting, and this is particularly apt to be the case in the more dangerous and more chronic stages of the malady.

While natural and safe outlet may be had by process of time and disintegration, and with much less serious results accruing than might reasonably be imagined, such is of extremely rare occurrence, and entails a vast amount of unnecessary suffering. Under such circumstances the "wear and tear" can hardly be estimated, for the vital resources are sapped, and a system already impoverished and poisoned is further jeopardized by delay.

To a query why mastoid disease is so severe in its course and results, a critical examination of the physiology of the parts involved affords ample reply. Aside from the anatomical relations already considered are:

First, a complex system of veins and venules that, in act of elimination, take up the poisonous products, bearing them to the heart and lungs, whereby the latter are overtaxed, when the remaining surplus is distributed to the general economy in vain effort to secure other outlets.

Second, an intricate net-work of nerve-filaments constantly convey the most delicate of morbid impressions and influences to the great centres. The *seventh* pair of cranial nerves is primarily devoted to the auditory apparatus; and through the third branch, by way of the *otic ganglion*, the *fifth* pair sends minute filaments to meet those of the *seventh* in the innermost recesses of the mastoid cells. Finally, it is well understood that the burdens of any one nerve, or series of nerves, however remote, are in some measure borne by the nervous system at large.

Third, in mastoid disease pus is enclosed in a bony case of great hardness and density, and while it sometimes penetrates the external wall, it is still held in firm bondage by the interposition between the bone and the outer integument of (*a*) a dense periosteum, and (*b*) tendons even more impermeable. Though it is *possible* for tendons and periosteum to be torn from their attachments by the accumulations of suppurative matters in their rear, it is by no means probable: further, it must be recognized that a terrible force is being applied to the inner or cerebral table of the mastoid, which, for obvious reasons, is usually the first to succumb. The most favorable result that can be expected by perforation of the outer table of the mastoid is a profuse abscess burrowing downward and backward among the tissues of the neck!

Whatever the character of the disease, local treatment must consist largely of douches of water, either with or without antiseptics, as may seem best, and as *hot* as can be borne. Every part of the aural cavity that can be reached must be gently but thoroughly washed out and the accumulations removed, and the syringing continued for twenty minutes to half an hour subsequently, allowing no decrease in temperature of the fluid. Thereby not only is speedy relief obtained, but inflammation is combated and aborted; and further satisfaction may be secured by subsequently employing a weak solution of cocaine or brucine, applying to the more sensitive areas. Where there is great sensibility, painting the aural cavity with a four per cent. solution of brucine facilitates research by means of the speculum. The use of oils, so popular and common, under any condition of health or disease, cannot be too severely apprehended, since they only serve to encourage filth; and caustics, almost as much in vogue, if demanded at all, should be applied *through* the speculum, and with the aid of reflected light and a soft, pointed, camel's-hair pencil. In the main, however, the hot-water douche fulfils every indication, acting as both poultice and sedative, and it has the superior merit of cleanliness, and of admitting repetition

as often as required. Atop of this, some antiseptic and mildly astringent powder may be blown into the meatus to absorb the discharges.

A vigorous evacuant rarely comes amiss in otic troubles, and is essential at any stage of mastoid disease to which the practitioner may be called as a preliminary to the therapeutics that must follow, whether surgical or otherwise. One is rarely permitted to view a case in which there is not marked disturbance of the general functions of the economy, including defective nutrition, owing to non-assimilation and circulation overburdened with poisonous and effete products. Indeed, constitutional difficulties may be the cause, rather than the sequel, of the malady. A mercurial (fifteen or twenty grains of calomel for an adult), with compound powder of colocynth, and, if need be, followed by a saline (sulphate of sodium or magnesium), will prove satisfactory, after which *quinine*, *iron*, *nux vomica*, *ipecac*, *euonymin*, *irisin baptistin*, and other tonics and alteratives, may be prescribed as required. *Small* doses of mercurial dichloride are uncertain and lead to vexatious delay, and for this reason I am accustomed to employ from one to one-and-a-third *grammes*, as above noted. And a preparation of iron that is at once a hepatic stimulant and tonic, and devoid of the objections pertaining to chalybeates generally, is the hydrated succinate of the peroxide of Stewart.

When there is no discharge from the tympanic cavity, and reflected light reveals the drum membrane intact, but tense and bulging, the operation of paracentesis should always be performed, and that, too, without delay, and immediately followed by the hot-water douche, and, if need be, by the use of Politzer's inflation apparatus *via* the posterior nares and Eustachian tube. This not only affords escape to imprisoned fluids, but contributes not a little to the comfort of the patient. It is far from being a difficult operation to one familiar with the anatomy of the parts, though, unless great care is exercised, it is an excruciatingly painful one. The knives or "darts" prepared for this purpose, and found in shops, are almost invariably clumsy and dull, whereas they should be of the *keenest*, and *newly sharpened for each operation:* a very minute tenatome, made to catch at an angle in its handle, the point fashioned like that of a delicate cataract-knife, is best. The objections that a drum membrane once perforated is never restored, and that deafness is induced, are utterly untenable.

Though the tympanic membrane gives little promise of mucus or pus within the aural cavity, paracentesis may often be performed to advantage.

When operative measures fail to afford relief, resort must be had to blisters, or cupping and scarification, over the tender and painful portion of the mastoid; oleate of mercury alone, or combined with oleate of *aconitine* or *veratrine*, if persistently employed, frequently answers every purpose that can be fulfilled by blisters, leeches, scarification, etc.

When all else fails, resort must be had to the knife, making a free incision over the mastoid at its most prominent part,—the promontory near the auricle. After freely incising the tissues to and through the periosteal covering, if no pus is found, the opening must be extended through the outer plate of the bone itself, when compensatory results invariably follow. Even if pus fails to reveal itself, the operation rarely fails to give relief, and the wound should be kept open and free until the last evidence of inflammation has subsided. Necrosed and carious bone should, of course, be removed as thoroughly as possible, and a drainage-tube employed if it seem at all desirable.

Many prefer a chisel or gouge as an operating implement where the mastoid is to be perforated. This is more a matter of the individual skill of the operator than any thing else, yet I prefer a cartilage-knife as being more readily controlled: it is less liable to slip, or to enter deeper than is desired, when, as sometimes happens, the outer plate gives way suddenly and unexpectedly. The examination of one skull is no evidence of the condition of another, and while the outer table of the mastoid in one individual will be so dense and firm as to demand a trephine, another may be penetrated by a minimum expenditure of force. By placing the finger along the back of the cartilage-knife, and applying the blade at its most rounded portion (back of the point), it is impossible to penetrate to a dangerous depth if fairly moderate care is exercised.

During treatment and convalescence, liberal and comprehensive diet should be allowed, including strong broth, beef essence, carbohydrates, etc. Cod-liver oil is frequently advantageous, but seldom well borne for any length of time, being merely an easily-digestible fat, but very far from being the best form thereof. Tonics, careful attention to general health, cleanliness, drainage, etc., will probably complete the work thus begun.

PICHI IN GONORRHŒAL PROSTATO-CYSTITIS.

By F. Gundrum, M.D., San Diego, Cal.

I DESIRE, in fact, I might say, I feel it a duty, to report the prompt and happy effect given by the fluid extract of pichi in the following case of gonorrhœal inflammation, involving the prostate gland and the (I think) entire bladder.

I am quite sure it will be almost needless to remind the experienced practitioner that when gonorrhœa extends into the prostate and bladder it becomes a matter of grave solicitude to the attending surgeon, and one of gravity and more or less suffering to the patient. I have treated quite a number of cases in the last twenty years where the gonorrhœal inflammation extended into the prostate or vesical neck, but this one exceeds them all in severity.

Mr. X., aged 32, is of a healthy family, and inherited a good constitution. Had good health until about two and a half years ago, when he was injured in a railroad accident. Among other injuries (no bones broken) was concussion of the spine, followed by chronic inflammation. He was treated for some two years in various ways, getting considerably better, but it left him debilitated, nervous, and considerably anæmic. To improve his general health was the main object of his coming to Southern California. After having been here for two or three weeks, he placed himself under my care to assist the climate in improving his health. By the use of tonics and general faradization he improved considerably in the course of three or four weeks, when he very foolishly embarked in a small business enterprise.

The climate seemed to have a wonderful effect on his sexual nerve-centres, as he told me when he came here his sexual desires were nearly, if not quite, *nil*, for about the 9th of March he visited an unchaste woman with the usual result. He treated himself, or was treated by some one else (being the old family physician of his father's family East, he was ashamed to consult me), for about three weeks, when severe and distressing symptoms came on, for which he consulted me on the 2d of April.

The symptoms were about as follows: Very little discharge remaining; a frequent desire to urinate, attended by much distress and straining; a dull, heavy pain in the perineum, extending into and up the rectum; a desire to strain, even though he has emptied the bladder; a heavy, dull ache in the lumbar region; no fever, and very little desire to drink; tongue coated some, and breath rather foul; bowels confined. Ordered him to take a Turkish or hot bath, and prescribed the following medicines:

℞ Calomel, gr. iv;
Extract colocynth. co., gr. vi;
Ipecac powder, gr. i;
Extract henbane, gr. i. M.

Make one capsule, to be taken after the bath, which was about 8 P.M.

Also to take the following:

℞ Acet. potass., ʒiv;
Bicarb. potass., ʒiss;
Fld. extr. henbane, ʒiss;
Syr. acaciæ, ʒvi;
Water, ad ʒviii. M.

One tablespoonful once in three hours. To have Hunyadi Janos if bowels did not move by 7 A.M. next day.

The next day the patient was seen about 10 A.M. Bowels had acted well; but the bladder symptoms were not relieved. As he had taken his medicine rather irregularly during the night, he was ordered to continue it, take some sitz-baths, and keep abed. By the 4th, having been considerably relieved, he put his clothes on and went down-town, but called on me next day in more pain than he had been at any time. His face denoted considerable suffering. He claimed to be in pain all the time, and when he was compelled to urinate he wanted to scream from pain. I prescribed:

℞ Pulv. opii deod., gr. xii;
Extr. bellad. alc., gr. iv;
Massa hydrargyri, gr. x;
Pulv. ipec., gr. vi. M.

Make twelve pills. One every two hours, until pain begins to lessen, then once in three or four hours.

Also take

℞ Sod. bicarb., gr. xxx.

Once in three hours in half glass of water. To have a full bath, and go to bed between woollen blankets. Diet to be spare, and principally of milk.

On the 6th patient was considerably better. The dull, heavy feeling in the rectum, the frequent desire to urinate, the spasm attending it, had very much abated. An examination of the prostate showed considerable swelling and tenderness, and pressure over the bladder seemed to elicit some pain. The urine was acid in reaction and contained pus-cells.

On the 7th he felt almost entirely relieved. Although the patient was ordered to remain in bed, he thought, as many others have and

will, viz., that doctors don't know everything. He got up; went to his place of business.

Before the expiration of thirty-six hours his symptoms began to return, and, feeling guilty, he refused to have me sent for until he was in perfect agony.

I now found him in bed, suffering extremely; more than before. A full hot bath was ordered, and this was followed by sitz-baths once in three hours. A prescription of corn silk, ℥i, acet. potass., gr. xv, and sod. bicarb., gr. xx, well diluted with water, once in three hours, was ordered, and flaxseed tea, two pints, in the twenty-four hours. After a few hours, the extreme suffering continuing, a suppository of extr. opium, extr. henbane, and cocaine, each one grain, was administered once in three hours. This plan of treatment was continued for two days without any benefit; in fact, the patient grew steadily worse. The discharge from the penis had now ceased; the urethra had become much swollen through its whole extent. The prostate was very much swollen, hard, and tender. This condition seemed to extend to the base of the bladder, as far as the examining finger could reach. There seemed scarcely any room left in the rectum, making examination very painful indeed.

The sitz-baths were ordered continued, only that he was to take them longer, remaining in each one hour. The urine being still acid, the following was ordered: ℞ Bicarb. and acet. potass., āā ℈i; citrate lithia, gr. v., well diluted; to drink two or three pints slippery-elm water in the twenty-four hours, and to have absolute milk diet. He was ordered as medicine to relieve bladder fld. ex. henbane, fld. ex. cannabis indi., of each 10 drops, to be increased two drops at each dose, until pain and spasm should be controlled or its physiological effect should compel us to discontinue the remedy. This plan of treatment was an entire failure, although it was persisted in for three days, the hypodermic use of morphine being resorted to during the last twenty-four hours. The suffering became excruciating; the swelling of urethra, prostate, and bladder grew more extensive. The region of the bladder in front became swollen and tender,—so tender that we couldn't let the bedclothing touch it. The patient became haggard, and wished he could die. As often as every five to ten minutes patient had to urinate, only a few drops coming, and those were thrown from the urethra with force. The bladder spasms seemed terrible. When they came the patient would writhe or scream, catch hold of his penis and pull at it, until I sometimes feared he would pull it off. Although there was no discharge from the penis of a purulent nature, the urine contained plenty of pus and blood-corpuscles. To above treatment I tried cocaine, eight grains to the ounce, in the urethra and bladder; but this the patient claimed burned like fire, and had to be discontinued after several trials. Fearing the cocaine might not be a good article, two other specimens were tried, with same result. The temperature did not exceed at any time 103°, and pulse 80 to 110 (natural pulse 54). As the hot sitz-baths seemed to relieve him some each time, I concluded to make them continuous as nearly as possible. Blankets were so arranged in the tub that the patient could recline and sleep. At about the beginning of the fourth day of last treatment he was placed in tub on blankets, and the limbs, hips, and lower part of abdomen placed in as hot water as the patient could bear.

The heat was increased after a while, as the patient became accustomed. He commenced at 8 P.M., and at 2.45 A.M. I was called, the patient screaming with pain. I gave him ⅓ gr. morphine hypodermically, which produced sleep for two hours. At this time he was taking 30 drops each of henbane and can. ind. (fld. ext.) every three hours, without the least beneficial results. I had now lost faith in my last plan of treatment. At the end of two hours of sleep, or, more correctly speaking, seminarcotism, the patient woke up groaning with pain. I now concluded to try opium, and so regularly administered hypodermics of morphine and atropine. The other treatment was continued, to which we added filling the rectum with hot water once in two hours, while patient was in sitz-bath. The opium quieted the spasm of the bladder considerably and lessened pain very much (patient was kept slightly narcotized). But the bladder would no longer discharge its contents. Having left patient five or six hours, I found him in extreme pain, trying to urinate every few minutes, and only succeeded in discharging a few drops. The bladder was full, and I soon relieved him with a soft catheter. That night he spent very comfortably. The following morning the patient was so weak that we could not put him into the sitz-bath. Although he was a little more comfortable, and there was a slight discharge from the penis, the local conditions were no better. The whole hypogastric region seemed swollen, painful, and very tender to the touch. The urethra and prostate

were as intensely swollen and fully as tender as before. There was a heavy pain in the lumbar region, a pain deep in the groin, and the right testicle and cord seemed to be slightly swollen and tender. Temperature 101°, and pulse 110. The rectal injections were continued in bed, as they seemed to relieve the patient very much. The continual use of the catheter produced a very tender and bleeding urethra, and patient wished me to discontinue morphine, as he preferred the pain and spasm to the use of the catheter. The opiates were discontinued, and, as their effects disappeared, the pain and spasm returned in all their severity. Henbane and chloral, flaxseed and tobacco poultices, ointments of belladonna and extr. opium, and a host of other things were tried, all to no purpose. A poultice made of flaxseed, ground lobelia-seeds, and tobacco the patient claimed relieved him more than sitz-baths. After the patient had fully come out from under the influence of the morphine injections, the urinations were as frequent, the spasm and pain as intense, if not more so, as they had been at any time. An examination demonstrated the fact that the inflammation was as intense and the swelling greater than at any time. I examined closely for pus, but could detect none. The hypogastric region became so extremely tender that we had to remove poultices. The hips were now swathed in layers of cotton batting, and covered with oiled silk. It became evident that the patient must soon get relief, or death would bring what the physician failed in. I seriously thought of opening the bladder, and while thus pondering, and trying to think of or find something, I remembered seeing pichi recommended for such troubles. I searched the files of the THERAPEUTIC GAZETTE, and found an article to the point. I immediately procured an ounce, manufactured by Parke, Davis & Co., of Detroit, Mich., and started to try its effects.

Thirty drops were given, well diluted, at 8 P.M. By 9 P.M. the patient had used the vessel five times (to urinate); pain as severe as ever. By 10 P.M., four times, less pain and spasm, and comfortable while in bed. From 10 to 11, three times, still better; from 11 to 12, twice, when he received the second dose of fld. ex. pichi, 30 drops; from 12 M. to 2 A.M., urinated once, almost free from any pain; urinated again at 6 A.M.; no spasm and very little pain. From this time on everything went well. The desire to urinate became less frequent; pain and spasm entirely subsided.

I must express my surprise at this magic effect. I was certain that we should find relief only by operative procedure. On the sixth day all symptoms of bladder disturbance had subsided, and our whole attention paid to a severe swelled testicle, when, after suspending pichi for four days, the old symptoms appeared, which were quickly relieved by pichi again.

I have related this case at considerable length and minuteness, if not tediousness, to show how severely gonorrhœa may attack the prostate and bladder, and what an efficient and prompt remedy we have in the fld. ex. of pichi.

ORLANDO, FLORIDA, AS A HEALTH RESORT.

By R. H. PEAK, M.D.

THE interest of the faculty in charge of invalid patients, and the equally important interests of the patients themselves, make resident physicians of ordinary health resorts the object of ceaseless inquiry as to the local hygiene and climatic peculiarities. As one of the older physicians, and of experience in their influence, I may be more frequently applied to than others, and, in order to give response to such inquiries, I solicit the courtesy of your very valuable THERAPEUTIC GAZETTE. Orlando, Fla., the centre of a now famous region of orange-culture, the county seat of Orange County, longitude 81° 30′, latitude 28° 32′, is upon one of the highest points of the State, at the narrowest part of the peninsula of Florida, nearly midway between the Atlantic and Gulf coasts. The land rises in gentle undulations from the valley of the Ocklawaha to the St. John's River, between Lakes George north and Tohapokeliga south, to its highest elevation,—one hundred and sixteen feet above the sea. The prevailing east winds of the Atlantic by day and Gulf of Mexico by night come ladened with the pungent aroma of the pine forests, and refreshed by ascending currents from the window-like lakes, softening the rough sea-breeze, and at all times grateful and invigorating to sufferers with throat and lung troubles. I speak from professional experience of more positively beneficial results than I care to state in a general letter. The mean humidity for the three winter months—78.4—compares favorably with the high plains of Minnesota, and the mean annual temperature—72.6°—is about that of Naples, Italy. The highest summer heat—

for a few days in August, noon—is 98° F.; but this is evenly tempered by the constant and alternating sea-breezes, and the cool afternoon clashing rains of summer, leaving the night air cool, clear, and wholesome. The heavy oppression of sultry summer nights of the high interior latitudes is never experienced in this region, and the summer dawn is refreshed with a slight chilliness, rendering a light blanket comfortable.

If my experience as a practising physician for six years, joined to previous studies and practice in the South, qualify me to express an opinion, I regard the situation of Orlando as preferable in all cases of throat and lung troubles, incipient phthisis, and the like.

In all its stages phthisis is relieved and life prolonged, the dry air making its climatic character preferable to the sea-coast. Catarrhal trouble, in all stages, is modified and relieved by residence without medication, and easily controlled with it. Asthmatics find a general relief in the climate, and in many instances a radical cure. Rheumatism is greatly ameliorated by the softness of the climate, and yields easily to treatment.

A striking peculiarity is the influence of the climate on the very young and very old. Infants and children pass lightly over the ordinary ailments of that period of life or escape them altogether. To the aged, the escape from the inevitable shocks and changes of a harsher climate, which an experienced physician so well understands and deprecates, acts like a tonic; a relief simple enough to the physician in charge, but which seems marvellous to a patient who does not understand that it is the mere conservation of natural strength relieved of those almost insensible draughts upon it. Perhaps the most satisfactory evidence to the physicians and parents of the exemption of children from dangerous maladies lies in the fact that scarlatina and diphtheria are entirely unknown, and cases of mumps, measles, and whooping-cough are exceedingly rare; rarely ever of sufficient severity to put the patient to bed. I have never known in my six years' experience of a case of typhoid fever or of a sunstroke, nor is there in any local or professional tradition an example of the curious disease hydrophobia. The yellow-fever has never been nearer than Tampa, a hundred miles south, nor, with the medical experience of the sanitary benefit of the pine forests, when that epidemic raged in New Orleans and Savannah, without penetrating their serene hygeias in Georgia and Louisiana, is it at all possible that the dread disease shall ever violate the sanctuary of our wholesome pine-woods city?

The town of Orlando, numbering some five or six thousand inhabitants, is incorporated, a mile square from the court-house centre, is laid among its fine large lakes and clustering orange-groves, in broad, well-kept, policed, and gas-lighted thoroughfares, having its streets laid in mains from the reservoir of the waterworks, drawing its supplies from a cool, highland spring lake. Handsome residences line the thoroughfares, or look out from the shade of their own shrubbery, built at a probable cost of from two thousand to eight thousand dollars each. The business portion of the city is handsomely built in brick, showing a graceful architecture not unsuited to the surroundings.

The market-house, a handsome brick structure, is supplied from the truck-gardens in the vicinity with a constant variety of seasonable fruits and vegetables at all seasons. Six large, handsome hotels accommodate invalids and tourists with all the modern improvements, and a table furnished with all foreign and native delicacies. Pleasantly located boarding-houses offer a choice of economy or retirement.

The church service is well supplied with buildings, and congregations of the Methodist, Episcopal, Catholic, Baptist, Congregational, and Presbyterian Churches, and three other buildings for a well-behaved and useful colored population. The public school is a matter of some pride and congratulation to the citizens, who regard its character and standing to be a deserved honor and credit to their young, thriving, and populous city, and a recommendation to the settler not to be overlooked or neglected.

WHAT IS THE ESSENTIAL CAUSE OF THE CONTINUED FEVERS OF MIASMATIC REGIONS, AND WHAT RELATION, IF ANY, DOES MALARIA BEAR TO THE CONTINUITY?

By B. Frank Humphreys, M.D., Hawkins, Texas.

IN the *Nashville Journal of Medicine and Surgery* for March, 1885, will be found an article by the writer on the nature and treatment of this class of fevers. The term "continued malarial fever" was used because it expresses more definitely than any other, perhaps, the characteristic features of the fever under consideration. This supposed innova-

tion upon the nomenclature of fevers gave rise to a lengthy controversy through the columns of the above journal,—between the writer and an advocate of the so-called typho-malarial theory, who assumed the unenviable rôle of critic. At the close of this discussion, however, the opponent of the views presented in the paper alluded to finally conceded, *nolens volens*, the existence of such a type of malarial fever (which he had virtually denied), and admitted the correctness of the term used to designate it, and he even went so far in his concessions as to quote Ziemssen's "Clycopædia" as authority to sustain the opinions against which he had been unwittingly contending at a disadvantage.

Following this controversy appeared a series of papers by the present writer in the issues of the same journal for June, July, and September, 1886, on the "Differential Diagnosis of the Continued Fevers of Malarious Regions," to which the reader is referred for a more extended consideration of this subject than the present limits will permit. Since the appearance of these papers, it is a source of satisfaction to the writer to know that other writers, far more able than himself, have discussed this topic in many of its relations, supporting, in the main, the views embodied in the articles referred to. Among many interesting and valuable contributions to this subject recently, the following papers are unique and worthy of note: Dr. Edward Squire, of London, in the *American Journal of the Medical Sciences* for April, 1887; Dr. Edward G. Janeway, in *Gaillard's Medical Journal;* a leading editorial on the same by Dr. P. Brynberg Porter, in *Gaillard's Medical Journal*, September, 1886; two leading editorials by Dr. H. K. Leake, in the *Texas Courier-Record of Medicine* for June and July, 1887. These excellent contributions are worthy of a careful perusal.

The continued fevers referred to prevail not only in this State, but doubtless to a greater or less extent in all malarious countries, mostly during midsummer and autumn. Cases of it are not infrequent here even during the winter and early spring. That the ordinary or prevailing type of continued fever (as seen in this State at least) is not a modified form of typhoid (enteric) fever, is established by the fact that the characteristic symptoms of the latter are absent as a general rule; when symptoms apparently similar to those of typhoid arise, they usually supervene after the fever has run several weeks, and they are regarded by many careful observers as due to the *typhoid* or *adynamic type* the fever has assumed, and not usually the result of a new or additional factor, as has been supposed by some writers. That it is a type of malarial fever is proven by the fact that the symptoms present the leading features of this class of fevers. True, it is not ushered in with the abruptness of our ordinary remittent fever, nor with the sharp diagnostic outlines given to it by the older authors, and likewise by some authorities of more recent date. The classic type of remittent fever is encountered here also, not infrequently either, presenting the symptoms described by the authors. It is ushered in abruptly, usually with a chill, followed by high temperature, nausea, or vomiting of bilious matters, epigastric oppression, furred tongue, fetid breath, and sweat peculiarly characteristic, headache, constipation usually, sallow complexion, etc.; the violence of the symptoms abate within one, two, or three days, followed by a decline in the temperature, a fetid diaphoresis usually, and a well-recognized remission; these symptoms, except perhaps the chill, being renewed after a few hours with greater intensity than before, unless the fever be arrested with appropriate treatment, of which quinine is the chief reliance to prevent the recurrence of the fever.

But continued malarial fevers, as a general rule, cannot, like the remitting type just described, be aborted by means of quinine, which perhaps has little or no influence, as far as can be observed, in limiting the duration of the fever, except possibly in rare cases when administered freely at or near a septenary period. Just why quinine fails to arrest or cure these types of fever, which are generally conceded to be of malarial origin, is a problem somewhat involved in obscurity. But this should be no more a matter of surprise than the fact that there are other types of malarial origin in which this drug has little or no curative power, but it is probably prophylactic, in certain instances, when conjoined with other suitable remedies. (See *Texas Courier-Record of Medicine*, December, 1887, page 125, "The Prophylaxis and Treatment of Malarial Hæmaturia," by the writer.) In these peculiar types of malarial fever, as maintained in the article referred to, there are certain underlying lesions existing, the result of a long-continued operation of the malarial factor before the patient is prostrated. If this opinion is well founded, we can now see how useless it must be to depend upon quinine so confidently as a curative agent in these pathological conditions.

By reference to the writer's articles during several years just past, it will be seen that this opinion has been advocated all through these contributions; and now, after further study and clinical observations, with a feeling akin to assurance, the writer commends this view of the subject to pathologists for further investigations with regard to the etiology of this class of continued fevers, and as to what relation, if any, malaria bears to their continuity and the underlying lesions, which may be of the stomach, liver, spleen, or kidneys, one or all, but chiefly, no doubt, of the blood, thereby impairing its integrity and physiological functions, as also those of the nervous system, resulting, as a logical sequence, in a continued fever, due to the causes enumerated, and, consequently, not amenable to the great antimalarial remedy which is so efficient and trustworthy in removing the *materies morbi*, if administered *before* the accession of these underlying lesions. If this conclusion is correct, it clears away much of the obscurity with which this subject has been surrounded, and invites us into new fields of investigation, in which we may hope to acquire a more definite and satisfactory knowledge of the etiology, pathology, and treatment of this class of continued fevers. It will enable us to treat the fever more rationally, and it will prevent us from oppressing the patient with huge doses of quinine or other drugs, in the vain hope of "breaking up the fever" with the so-called "specific for all forms of malaria."

The introduction into the blood of a specific miasm, for example, produces certain blood-changes, followed by a specific malady, which is identified by the characteristic lesions which accompany it, as Frerich, Virchow, and many other noted pathologists have taught. So generally is this view entertained by leading pathologists as to the essential cause of many affections, it would seem strange, indeed, if this position could not be maintained in its relation to the continued fevers of malarial origin. The late Dr. Austin Flint, in discussing this topic, very truly remarked: "The most rational view of the source of disorders referable to the circulation, to the various secretions and excretions, nutrition, together with morbid states of the muscular and nervous systems, is, that they proceed often, if not generally, from blood-changes. The blood offers at the present moment a most interesting and promising field for the scientific inquirer. It is here that important discoveries are to be made which will shed light on the nature and source of diseases now imperfectly understood. In view of the physiological relations of the blood, and what has already been ascertained respecting its pathological relations, it is safe to prophesy that future revelations in pathology are mainly to come from analytical, microscopical, and experimental researches in this direction" (Flint's "Prin. and Prac. Med.," 4th ed., page 100). While the foregoing views are not designed to revive the doctrine of the old humoral pathologists, on the one hand, neither is it intended to completely ignore or repudiate *in toto* their doctrine that the *primary* morbid conditions in most diseases are seated in the fluids, although it is now generally believed that "many, if not most, of the morbid changes of the blood are *secondary to* and *dependent upon* local morbid processes in solid parts" (Flint), and the writer admits that he is inclined to this opinion, which is ably maintained by Virchow, who substantially holds that "the indeterminate blood-changes which constitute the essential pathological conditions in the different cachexiæ or dyscrasiæ may not *originate* in the blood, but may owe their *origin* to the continued introduction into the blood of noxious matter derived from local sources, or to *effects* of some kind produced by certain organs" (Virchow's "Cellular Pathology," Lecture VI.). Now, it is believed that in the foregoing views of these and other distinguished authorities is discovered "a thread guiding us far through the labyrinth of pathology," by means of which we may arrive at a rational solution of the questions under consideration. "The continued introduction into the blood of noxious matter derived from local sources" is probably the *fons origo et mali*, while the *effects* of this original cause upon certain organs, and especially upon the blood, may satisfactorily account for the continued character of the fever.

Pathologists attribute the gravity and duration of typhoid fever to the extent and persistence of the intestinal lesions to which the continued character of the fever is probably due. It is also known that the typhoid poison, whatever that may be, lays the foundation of the disease, even before the patient takes his bed in many cases, the characteristic lesions of the malady having already been produced. How idle, then, does it sound to hear one speak of "aborting" or "breaking up" a typhoid fever! Now, if the specific cause of typhoid fever is capable of producing special lesions, to which the continued character of the fever is due, is it less reasonable—though less apparent, perhaps—

that the continuity of malarial fevers is due to similar causes? Why not? The position seems so logical and tenable withal, the wonder is that some one has not claimed priority, and advanced the idea as a step in the right direction to solve the following problems, concerning which there is so much confusion and diversity of opinions: 1. Why is it that quinine does NOT arrest the continued types of malarial fever? 2. Why is it that this drug is powerless in curing malarial hæmaturia? 3. To what is the latter malady due for its existence? 4. To what are malarial fevers due for their continuity? When these questions are correctly answered, it will probably be as idle then, as now, to talk or write about "breaking up" these types of malarial fever with "quinine," or any other special drug, as to attempt to accomplish the same results by the same means in typhoid fever. The treatment cannot, perhaps, accomplish any more in the former than in the latter, which should be, for the most part, conservative and supporting, combating symptoms as they arise.

While there is much evidence that many of the fevers of tropical and subtropical regions owe their origin to malaria, there are also good reasons for believing that "the all-absorbing influence of malarial doctrines" has prevented, to a great extent, an impartial inquiry in relation to the etiology of other fevers indigenous to miasmatic and tropical regions, most of which, except the rare cases of typhoid, are usually, but perhaps not wisely, accredited to malaria, without a special inquiry as to the possibility of these fevers, or some of them, at least, being due to some other cause, the origin and continuity of which, albeit, may be involved in obscurity.

Now, it has already been observed by Professor H. C. Wood and Dr. John Guitéras, of the Marine Hospital Service, that there is a class of fevers in tropical countries the origin of which cannot reasonably be attributed to malaria, nor to the typhoid source of infection, but rather to telluric influences, as this class of fevers has been recognized and differentiated from other climatic fevers in non-malarious districts, as shown by Dr. Guitéras at the Key West Hospital, where miasmatic and typhoid fevers rarely, if ever, originate (THERAPEUTIC GAZETTE, March, 1885).

The pathogenesis of this class of tropical fevers, which have hitherto been so rarely identified, is at the present time imperfectly understood, but their origin, and possibly their continuity, is most probably due to the apparent cause suggested by the distinguished authorities mentioned; and the writer believes that he has encountered the same fever in this avowedly malarious locality, the differential diagnosis between the latter and former class of fevers being sufficiently apparent to justify the nosological classification, as already shown in detail in the contributions previously referred to.

The long-continued and excessive heat of tropical latitudes and adjacent regions seems capable of producing, not only in feeble and overworked persons, but possibly in some robust constitutions, a depression, exhaustion, or paresis, more or less pronounced, of the inhibitory apparatus of the heat functions, thereby impairing the normal equilibrium between heat production and heat dissipation,—the difference in the duration or intensity of the fever affecting one person, as compared with that of another, being due, perhaps, to the difference in the impressibility of the respective individuals, or to the different degrees of exposure, just as we would account for like variations in the mild and pernicious types, or individual cases, of typhoid or malarial fevers. Dr. Guitéras, in his paper referred to, observes: "Whatever the nervous mechanism may be that inhibits the heat production of the body, it certainly is overtasked during the long summer of the tropics. . . . In the sickly and overworked, it is my opinion that an exhaustion of these controlling centres is brought about which gives rise to the fever."

Dr Maclagan, in the Clinical Society of London (*Lancet*, March 31, 1888), maintained in relation to the physiology and pathology of hyperpyrexia, "that the metabolism of the tissues is interfered with through the nervous system, there being a kind of paralysis of the inhibition which normally keeps the tissue-changes within bounds, and that the resistance or inhibition of the heat-centres being removed, hyperpyrexia results." Now, it is believed that telluric influences, which may or may not be complicated with other agencies, are as powerful as any other means, perhaps, in their action upon the impressible class of individuals referred to, and may produce the highest degrees of hyperpyrexia. However, this is not a frequent occurrence, owing to the inherent tendency of the physiological functions to resist any extraneous influence that may be capable of perverting the intrinsic or natural harmony and order essential to "the eternal fitness of things." Nevertheless, it seems quite apparent, if the cause already mentioned is capable of producing, under

favorable circumstances, a fever of extreme hyperpyrexia, it follows, as a matter of course, that the same cause, acting against greater resistance, may produce a fever of less intensity,—one having a moderate pyrexia,—which is the usual character of this class of fevers.

With regard to the treatment of the continued types of malarial fever, the preliminary course may consist of the remedies usually administered in simple remittent fever, for the purpose of eliminating, as far as possible, the *materis morbi*, thereby permitting the fever to run its course with less discomfort and with less danger to the patient. Dangerous symptoms are to be palliated as they arise. The hepatic, renal, and cutaneous secretions should receive due attention, never overstimulating them; and, on the other hand, never permitting them to become suspended or retained within the system any considerable length of time, which, as a matter of course, would intensify and prolong the fever beyond its natural course and duration.

The diet should be varied, nutritious, in the liquid form, of which peptonized milk, in some cases, will be found very essential, as also some of the many concentrated and partly-digested foods prepared for invalids.

When the fever is of a mild type, very little treatment will be required,—something like the following outline: After the introductory or preliminary treatment just mentioned, an occasional resort to antipyrin or other antipyretic, and the application of cool or cold water with the sponge; aperients and diuretics when necessary; tonic doses of quinine; wine or brandy when indicated; and, in some cases, an opiate or other hypnotic to procure sleep at night.

Hyperpyrexia will require more energetic treatment. The favorable report of Dr. John Guitéras (THERAPEUTIC GAZETTE, March, 1885) in regard to the value of cold baths in the treatment of the "continued thermic fever," as seen by him on the coast of Florida, is worthy of trial in some exceptional cases of other types of continued fever, when the temperature cannot be readily and safely controlled by other and more convenient means.

The most recent and interesting discussion on the treatment of hyperpyrexia by ice-packs, as advocated by Dr. William M. Ord, in a paper read at the meeting of the Clinical Society of London, March 23, appears in the *Lancet* of March 31, 1888, and in the THERAPEUTIC GAZETTE of May, 1888. Dr. Ord gives in detail the clinical record of a violent case of acute rheumatism, with cardiac and pleuritic complications, in "a heavy beer-drinker," who had recently been admitted into St. Thomas's Hospital. The temperature on the fourth day had gradually ascended from 101.4° to 108.4°, previous to which he was very violent, had hallucinations and delusions, and was with difficulty kept in bed; but now, with a temperature of 108.4°, the patient had fallen into a state of restless unconsciousness, with tremors. . . . The ice-pack was now applied, and was maintained for four hours, at the end of which the temperature was 100°, the patient had recovered consciousness and spoke sensibly, and the pulse had fallen from 160 to 100; afterwards, for a week, it ranged between 100° and 101°. On the eighth day after admission the temperature went up to 105.4°, the patient having passed through delirium into restless unconsciousness. The ice-pack was again applied, and reduced the temperature to 100°. After this the patient made a steady recovery, and was discharged six weeks after admission in good general health, and without sign of lung- or heart-disease. Dr. Ord brought the case before the Clinical Society, not because it presented any thing new or original, but with the intention of emphasizing the value of cold applications to the surface of the body in hyperpyrexia. He urged that, notwithstanding the acknowledged value of various antipyretic drugs in pyrexia, their use in hyperpyrexia was comparatively unsafe, large and frequent doses being required, whereby toxic symptoms were often produced.

Dr. C. J. Arkle read the notes of two cases treated by cold. One was a young man, aged 27, admitted into University College Hospital with an ordinary attack of rheumatism. On admission he was treated with large doses of salicylate of sodium. The night after admission he became very delirious, the joint-pain disappeared, the skin was hot and burning, and the temperature went up to 110.4°. After employing the ice-cold bath for forty minutes the temperature fell to 97°, but ran up four hours later to 107.2° while taking antifebrin. The bath was repeated for twenty-five minutes, after which the temperature fell again, and showed no further tendency to run up again excessively. The other case was that of a lady, aged 30, with rheumatic fever, whose temperature on one occasion went up to 110.4°, while the patient was violent and delirious. No bath was available, so she was treated with ice-cold packs, which reduced the temperature in one hour to 101°. After

this the temperature was kept at the normal standard with salol and salicylate of sodium, the patient finally recovering.

Further discussion was participated in by Drs. Maclagan, Coupland, Broadbent, Basil G. Morrison, Barlow, and Angel Money, all of whom concurred with the essayist and Dr. Arkle with regard to the value of ice-packs in hyperpyrexia, which doubtless will be resorted to more frequently for the relief of this dangerous and alarming condition.

This subject will now be dismissed without further reference to treatment, which it must be admitted is a digression, but one that is pardonable perhaps. In discussing the questions under consideration, the writer has carefully endeavored to give no cause for a disagreeable and useless controversy, to avoid which the views expressed herein have been presented with a cautious respect towards those who may believe otherwise, while the opinions advanced have been advocated impartially and without apprehensions of successful contradiction; at the same time no effort has been made to originate some new theory on the one hand, nor to advocate old errors on the other, but rather to discover, if possible, the truth in relation to the essential cause of continuity in the respective fevers indigenous to malarious and tropical latitudes.

Upon impartial investigation, it is confidently believed that the position taken in this paper will be considered as a step in the right direction, if nothing more; and it will probably be admitted, sooner or later, that it is more rational, and certainly not less tenable, than the old and incongruous doctrine—now almost abandoned—that the continuity in most, if not all, of these tropical fevers is produced by malaria alone, or conjoined in some inexplicable manner with the typhoid poison, and that this source of infection, like some perennial stream whose fountain is poisoned, incessantly diffuses itself into the vital organism, thereby giving to these fevers their continued character,—a theory that has not been sustained by the crucial test of clinical experience and by the unerring proof of pathological confirmation, upon which the foregoing arguments and deductions are chiefly based. Therefore, by these clinical lights and by these pathological landmarks, let the opinions enunciated in this contribution be impartially tested, and by this ordeal let them stand or fall.

If the thoughts presented in the preceding pages should possibly be the means of inducing other investigators to take hold of this subject and give it the consideration necessary to enable them to arrive at a correct solution of the questions involved, the writer will have accomplished his purpose and feel amply rewarded.

MASSAGE THERAPY: A CLINICAL RECORD, WITH SOME COMMENTS.

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MASSAGE, or mechano-therapy, is a part of the Renaissance of medicine. Over twenty years ago, and before there was a book, or perhaps a magazine article, relating to the same printed in this country, I had occasion to test it, guided more by instinct than by precedent, or the logic of physiology. The 1st of February found me in a thriving village, a short distance up the river from New Orleans, threatened with typhoid fever. Not being acclimated, and from other causes, the case doubtless was, as afterwards reported, critical and exhausting. The first intelligent mental impression dawned upon me during the fourth week. Although among comparative strangers, a large, airy room was assigned me, and the kindest attention, with exacting neatness, observed in all the surroundings. Instead, however, of congratulating myself, I was ungrateful, and inspired with a fiendish obstinacy. My thoughts were a constant terror to me, and insomnia lengthened the nights interminably. It seemed a case of total depravity. I was dysthymic, dyspeptic, dysthetic, dysuric, and dysphoric. I cursed the cook, scolded the doctor, who was, I afterwards learned, a former college chum, and one of the most amiable, skilful, of men. One alone remained who held my entire confidence, an ex-slave, my nurse and body-servant. Everybody who recalls a similar experience will not forget the helpless adoration one has for him who lifts you with such tenderness, freshens the pillows, expels the flies, but who handles each limb as cautiously as if it were a Japanese vase. One morning I called his attention to my anatomy, and reminded him that it was of no value except as a pathological study. My hair was mostly absent; my eyes apparently artificial; teeth discolored; skin like parchment; fats absorbed; and each muscle outlined like those of a manakin. I had will-power, but could not command a joint nor muscle below the trunk. Next day I told him the story of the Olympian games, the wrestling, the throwers

of the discus, and the runners ; how the attendant "iatraleiptes" manages the victors when returned to their tents almost paralyzed from exhaustion. I endeavored to convey to him that for about thirty days and nights, during which he had watched me, I, too, had been wrestling Every twenty-four hours had cost a pound of fats, carbo-hydrates, proteids, etc., in the struggle. I desired him to lubricate the sheaths of my muscles, tendons, cartilages, and joint-surfaces. He must flex every joint ; stroke, tap, and manipulate the muscles ; stimulate the capillaries and lacteals ; knead the peritoneum and digestive tract ; rub along the spine and shampoo the scalp. The pain was keen in the outset, but rest followed the sense of fatigue, and by the 1st of April I walked alone, and on the 13th was able to travel.

Later on, during that year, a companion was taken with the same malady. He was a young man of 24 years, with a fine constitution, of faultless habits and family history. We were then less fortunate in the local surroundings, and, as the season was more advanced, became involved by unfavorable sanitary conditions. After the crisis was fairly over we adopted the same passive exercise,—"hospital gymnastics," as it was termed,—and from that and subsequent observations I believe there was not less than one month's time saved the patient.

The third case of massage test on the list occurred two or three years later, in the person of a lady with a history as follows : She was 33 years old, unmarried, not a type of health, but, with the usual precautions, a fair average of the American society standard. When first called, she reported that she returned from Europe three weeks prior. She stated that she was afflicted with obstinate constipation from the day of sailing, and declared that no solid material from that hour had passed by way of the digestive tract. She was anæmic, depressed mentally, extremities cold, and altogether quite discouraged as to her future, not to say indifferent. The ordinary methods indicated failed to give relief, and, as time was important, after resorting in vain to electricity, I instituted the massage. That, together with the electric current at night to induce sleep, stimulated the unwilling machinery till a normal condition succeeded. The utmost caution was deferred to in this case, as the peritoneum was extremely sensitive and the condition of the intestines a matter of speculation, although symptoms pointing to grave apprehension were not wanting. In some way this was one of the most interesting incidents of the entire list, and since that time I have felt more secure in attacking that type of awkward and obstinate ailments.

The fourth subject came with a lesion due to a surgical injury to the face and neck, which left a scar, more inconvenient as a personal deformity than otherwise. The young man was well nourished and of excellent natural circulation, as well as patient under the somewhat long-winded effort. After a process involving some interval of time and mutual forbearance, the reward seemed to be satisfactory, as scarcely a trace of the eschar survived, and that was confined to a depressive submaxillary rather difficult to reach and chiefly unobserved.

Another case, apparently similar in result, but due to a burn, was attacked. The parts involved were fibrous and inelastic, so that surgical aid was required to effect the desired relief. This class of unfortunates may be greatly aided if the cases are comparatively recent, and they are willing to submit to the sometimes tardy process of nature. Records of sprains occur, in which the acute stage is favorably modified, and repair of the tendons and ligaments give rather brilliant and hopeful prospects in that direction.

One of the most instructive lessons in a surgical way was a history of a young Englishman of 35 years, who fell a victim to the fury of a bull weighing nearly two thousand pounds. The encounter left the patient with some hemorrhage from one lung, an injury within the abdominal cavity, fracture of the right os innominatum and luxation of hip-joint, together with fracture of the shaft of femur and tibia, same side. The spine was subsequently found to be included, as doubtless compression of the cord could best account for a certain train of symptoms. This person, taken abruptly from the habits of active exercise and out-door engagements, and followed by compulsory rest, during a history of peritonitis, added to the interval necessary to secure union in a line of fractures extending along the entire lower extremity, appealed to one both by his courage and impatience. Lest his splendid muscular condition should become inutile when we wished to avail ourselves of its vigor, the side involved was fixed permanently, but at the earliest date the balance of the system was cautiously exercised by a skilful attendant, under observation. The accident occurred late in August. By the 10th of October he was able to resume business, at some risk, and

in the following December had no occasion to use either crutch or cane. Of course, it requires some patience in behalf of the invalid and not a little mutual courage; but, to balance the part assignable to the pathological condition, and the attention which is due the healthy tissues properly, is worth the effort.

Another class falls to the lot of every practitioner, which is now usually turned over to the specialist. I chanced to have two young misses come for consultation with curvature of the spine. One was 5 and one 11 years old. Their home in each case was as favorable as may be in relation to hygiene, exercise, etc. I determined to place them both under the same *régime*, relying upon an apparatus to give artificial support, as indicated, and alternating rest, as well as supplementing it by a most thorough course of massage, affecting the short spinal muscles. The mother of one became impatient, and I gave her a letter to the best authority I knew of in one of the central Western cities, where she designed to pass the winter, and where the child was placed in the permanent immobile dressings. After an absence of six months the latter returned quite emaciated, but not much changed otherwise. It was apparently an instance in which the irritation of enforced confinement embarrassed the patient in a general way more than it improved the local condition. The history of the other, after about four years, is that of one apparently in health and free from inconvenience, beyond the bother of a shoulder-support, not contraindicated in the growing age if worn by day and laid aside at night.

Such instances, however, tempt one to continue massage as an item in general development. Some other cases of similar type have reassured me that we must exercise some judgment, if also a little risk, to meet all contingencies. From certain results found in the application of massage to peritonitis, when convalescence has been long continued, I have secured great relief in that class of patients. It stimulates the absorbents and limits adhesions, as also eliminates unfortunate sequelæ.

The term lumbago covers a class of painful and obstinate affairs of local rheumatic lesions, which are, perhaps, best amenable to the massage management, combined with the electric current. The remedy sought involves pain to the patient in the outset, but if used with judgment and persisted in, ultimately is more gratefully considered. Lead-poison paralysis and contingent gout yield to this form of pressure, and, with proper restrictions in strengthening the flexor muscles, some very brilliant successes are recorded in such form of defective innervation. Sciaticas, and, in fact, all neuralgias due to a local stasis or lesion, are now recognized as the peculiar field of this special treatment. Chronic forms of rheumatism require a test from the patient, which infers determination to be rid of the disease, but the limit of endurance is within the will of most persons, and my records show that the apprehension appears less formidable after the first few exercises, whence the patient is vastly encouraged.

In diabetes there is a stage where the skin may be utilized through the massage exercise, and, in fact, whatever form of treatment be used, it is not fair to the patient to omit this sort of relief to the office of the kidney in any of the Bright's diseases. In this connection it may be commented that not only recent adhesions, but long-standing pleuritic bands, are broken up and lung-capacity fostered by this method. It is, perhaps, the only logical resort where surgical operation is not imperative in such cases, as also when, after pneumonia, accumulation of pus is found in the dependent portion of the chest-cavity. I find some interesting notes as to certain forms of skin-diseases, in which the deeper layers are involved, which show most excellent results from percussion. Whenever local application to the cornea or sclerotic layers of the eye do not tend to heal the lesion, much aid may be had from gentle pressure, after the manner taught by the German, by which the lymph is dissolved and obstructed channels reopened.

Neuræsthenia and malaria, which develop in that form, should never be allowed to master the attendant without the assistance which this adjunct offers. There are some brain-workers of the more intense and effective type who are subject to relapse into indifference, if not melancholia, and who suffer from the congestive habit, liable to involve some one or more organs of the abdominal cavity. In many cases it is due to consecutive hours passed in some favorite position, which they assume when absorbed in their mental effort. This class of sufferers may secure immunity and length of years, as well as freedom from great mental depression, by the massage therapy, conjoined with some cast-iron rule of exercise, which they may be encouraged to follow.

The "writer's cramp," further, while not allied directly to the above phenomenon, is a source of great inconvenience, not alone to those who follow literary work, but to all

confined to desk employment, and is a form of neuritis in which massage seems peculiarly adopted, even when electricity has failed to give relief.

Massage therapy, like some other good things, has an antiquity difficult to measure, and it may be only estimated. We find, upon investigation, that it was a part of the classical teachings of Hippocrates (460 B.C.), and that in his time they referred it back to the authorities of China and the Hindoo practice. Of course, most of my records were observations prior to the translation of Cong-Fou or Tao-See into English, and when the unscientific discourses of Peter Henry Ling, of Sweden, were unknown to most writers. Up to 1870 the literature of mechano-therapy was limited to a few magazine articles. The total number of pamphlets which appeared in 1874 was four magazine essays. In 1875 one more, and in 1879 nineteen are found, accredited to the various languages. Within the past ten years only has it been freely discussed. A few years back its merits were clouded through the appropriation of it in France by charlatans, who claimed for it a mysterious and psychic influence. The Germans, however, have of late placed it on a philosophic basis. When investigated and approved by such men as Newman, Koch, Richter, Sée, Blanche, Piorry, Morrell, Lea, and S. Wier Mitchell, it seems to have a secure basis in the future. Dubois-Reymond has made some recent experiments which give much light to the office of massage, when utilized to aid nature in repair, based upon a physiological law. He explains *how* and *why* passive exercise promotes increased vitality, and hence power of resistance, a condition which has been recognized as a habit of nature from the most ancient records, although the law was undiscovered. Lister has taught how to confine a local injury or surgical operation to the narrowest limits by antiseptic and aseptic appliances. He seeks to eliminate external mal-influences. Massage seeks to prevent the extension of a malady by promoting health in the balance of the body, and thus avert a local ill from becoming a constitutional one. It cannot displace cold-water treatment in a typhoid case, but may anticipate bed-sores, and keep the muscles and joints stronger for resuming their office when convalescence has set in. It may not interpose to prevent paralysis after diphtheria, but will soonest relieve that sequel. It is not a complete system, but a part of the art of medicine, and only so should be regarded. It holds a place not unlike gymnastics in health, or diet in disease or health, or quarantine and fumigation to limit an epidemic of contagion. It is, therefore, an adjuvant, and when used under proper conditions, applicable to a large variety of diseases.

SEVENTEENTH AND MONROE STREETS.

TREATMENT OF THE UMBILICAL CORD.

DR. PH. FAGONSKI publishes in the *Vrach* some observations on the different methods of dressing the umbilical cord after it has been tied. He employed four different methods in a hundred cases each: in the first series gypsum, in the second talc, in the third Runge's mixture (salicylic or boracic acid with potato starch), and in the fourth hygroscopic cotton-wool. In the first series erythema and intertrigo occurred five times, ulceration around the umbilicus four times, slight hemorrhage from the cord seven times, and slight suppuration twice, dry gangrene or mummification of the cord occurring in every case. In the second series ulceration occurred five times, slight hemorrhage ten times, suppuration forty-eight times, moist gangrene thirty times, and dry gangrene seventy times. In the third series erythema and intertrigo were noted three times, ulceration twice, hemorrhage eight times, suppuration fifty-one times, moist gangrene sixty-five times, and dry gangrene thirty-five times. In the fourth series erythema and intertrigo occurred twice, ulceration three times, hemorrhage four times, omphalitis followed by death twice, suppuration twenty-nine times, moist gangrene twenty-eight times, and dry gangrene seventy-two times. With regard to the time of falling off of the cord: in the first series it was usually on the fifth day (never later), in nineteen cases on the fourth, and in four cases on the third day; in the second series separation occurred in the majority of cases later than the sixth day, in six cases only being on the sixth day, in four cases on the fifth, and in one case on the fourth; in the third series the cord fell in four cases on the fifth day, and in the remaining ninety-six cases after the sixth; in the fourth series it fell on the fourth day in one case, and after the sixth in the remaining ninety-nine. It will thus be seen that the safest and best of these dressings is gypsum, but it must not be applied too liberally, for it is quite possible for it to set up erythema. Dr. Fagonski recommends that all cases should be dressed simply with ten grains of gypsum and cotton-wool. —*The Lancet*, July 14, 1888.

The Therapeutic Gazette

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Leading Articles.

PHYSIOLOGY OF THE THIRD STAGE OF LABOR.

THE spirited discussion on the management of the third stage of labor that has recently arisen between Credé and Ahlfeld suggests the fitness of a brief review of certain items of moment in the physiology and conduct of the period of the after-birth.

"If," writes Dr. Berry Hart,* "the delivery of the placenta depended on obstetricians knowing how it separated, no woman in labor would complete her third stage." This remarkable assertion strikes the casual reader as a sacrifice of fact for the sake of a pseudo-epigram, seeing that the late, exact researches into this subject, of the Germans in particular, go far towards supporting views current nearly a generation since. But the animus of the remark soon becomes apparent,—the writer has an hypothesis of his own to propose. Before looking into Dr. Hart's supposition let us consider the principal theories that heretofore have been regarded as more or less fully explanatory of the phenomena.

In 1865, Schultze, of Jena, illustrated in his familiar "Wandtafeln" (Tafel, xvi.) Baudelocque's theory on the mode of separation and extrusion of the placenta from the uterus. He showed that during labor the lower two-thirds or more of the membrane are loosened, and the after-birth detached in part from the uterine parietes by the contractions that effect the expulsion of the child. After the completion of the second stage, a surface reduction of the placental segment of the uterine wall occurs as the result of retraction and contraction that the after-birth cannot follow. Its centre yields, and is thrown up into a fold protruding into the cavity of the ovum, while a retroplacental hæmatoma is formed, that further aids in the separation, commonly from the centre towards the more firmly adherent periphery. Little by little the placenta sinks downward in the direction of least resistance, with its fœtal surface in advance, pulls the membrane from the uterine walls by its own weight, and finally emerges into the vagina in a shape that has been compared to an inverted umbrella. This mode of detachment and expulsion was looked upon for a long while as the typical physiological process.

J. Matthews Duncan,† in 1871, described another mechanism, that was later accepted as the typically normal modus by Spiegelberg, Credé, Fehling, and others. The separation, according to Duncan, begins at the periphery, and proceeds towards the centre, while the retroplacental hæmatoma is of inconstant occurrence, and seldom plays an important rôle. The after-birth is never inverted when the process of spontaneous separation is not disturbed, and the organ passes edgewise through the cervical canal.

To speak accurately, Baudelocque's account of placental separation includes both of the mechanisms described by Schultze and Duncan. Thus he‡ writes: "Sometimes the disunion commences at the centre of the placenta, and sometimes at a point in its circumference, and so different phenomena are produced. In the first case, the middle of the placenta, being pushed forward, forms a pouch, that fills with blood, and that presents to the touch its surface, covered with membranes and vessels. A closely similar pouch forms, and the placenta presents in the same manner, when the separation begins at the point in its border that is farthest removed

* *Edinburgh Medical Journal*, July, 1887, p. 12.

† *Edinburgh Medical Journal*, April, 1871.

‡ 5e édition, t. i. p. 395.

from the uterine orifice. But things take place differently when the placenta is detached from below, especially when near the orifice. In the latter case it rolls upon itself in the form of a cylinder or of a rolled wafer, and suitably to the length of the uterus, in such a manner that it presents its rough surface to the touch or the sight, and its exit is always preceded by the discharge of a greater or less quantity of blood."

Recent observations confirm Baudelocque's views. Thus, Pinard, out of sixty cases, noted presentation of the fœtal surface fifty-one times; of the edge, seventeen times; of the maternal surface, twice. Ribemont-Dessaignes, out of seventeen cases, observed Schultze's mode twelve times, Duncan's mode four times, and presentation of the maternal surface twice. Ahlfeld* describes the separation of the placenta, that he actually saw in a case of Porro's operation, in accord with Schultze's theory, although he admits the occurrence of Duncan's mechanism in about twenty per centum of all cases. According to the observations of Richard Werth,† elevation follows the reduction of the surface urea of the placental segment of the uterine wall, not in the form of a simple fold, constituted by the entire placenta, but in several longitudinal rolls, while the organ as a whole is arched over its fœtal surface from the sides,—a mechanism that corresponds in part to the accounts of both Schultze and Duncan. But the most valuable contribution to the literature of the subject within the last few years is found in Schroeder's "Schwangere und Kreissende Uterus."‡ Schroeder's method —the same as that used by Cohn and Werth —consists in the introduction of the hand within the uterine cavity immediately after the expulsion of the child, and the direct palpation of the placenta and membranes. Of course, this method is liable to unavoidable sources of error. The hand may detach the placenta, or it may interfere with the normal separation, or, finally, it may disturb uterine activity. It yields results, however, that, after correction by the study of plane, frozen sections of the parturient uterus, and the observation of placental separation *in viva*, as in Cæsarean section, may be accepted as conclusive. In the cases observed by Schroeder, the after-birth was detached, as a rule, after Schultze's mode, in exceptional cases after the manner of Duncan, and then only in the event of lateral insertion near the internal os. "The hand lying in the cavum uteri feels one or several large folds of the placenta projecting into the interior of the egg, until the apparently detached centre of the placenta sinks downward towards the internal os, and the placenta, inverting and tearing loose the membranes, descends below the contraction-ring. In the typical cases, in which the placenta is situated nearer to the fundus, this inversion of the membranes is so complete that scarcely a drop of blood escapes until the placenta, with its fœtal surface in advance, appears at the vulva. The sac formed by the membranes and the uterine surface of the placenta is then found distended with blood."§

Schroeder also answers satisfactorily the question of obviously great practical moment, Why is the placenta so seldom detached before the birth of the child, and why does its detachment follow so precisely and almost invariably the birth of the infant? The surface reduction of the placental segment of the uterine wall, as the result of retraction and contraction, *per se*, does not constitute an adequate explanation, since the hollow muscle of the uterus is not seldom in almost as high a degree of tonus and clonus during the second as during the third stage of labor. The placenta, although possessing no truly contractile element, may still accommodate itself to the diminished area of its site in such a degree as to maintain partial attachment. This fact has been abundantly demonstrated by Schroeder's plane, frozen section, and has been repeatedly pointed out by Barbour and others.

During the second stage of labor, with every contraction, the intrauterine pressure is increased in a degree exactly proportionate to the force of the contraction, so that the placenta is pressed against its site of insertion. After the expulsion of the child, the intrauterine pressure sinks to a point equal to, or even less, than that of the atmosphere, and the force developed by retraction and contraction assumes a purely centrifugal direction, when the after-birth is readily cast off. Examples of separation of the placenta after sudden diminution of intrauterine pressure are not of infrequent occurrence. Thus, after the birth of the first twin, and the escape of a large quantity of liquor amnii, after the

* Abwartende Methode oder Credé'scher Handgriff. Leipzig, 1888.

† P. Müller, "Handbuch d. Geburtshülfe," i. Bd. p. 434. Stuttgart, 1888.

‡ Bonn, 1886.

§ Loc. cit., p. 96.

introduction of the hand in turning, and in many cases of premature detachment of the placenta, the operation of this factor in the separation of the after-birth is often evident. In two cases of Cæsarean section that have come under the writer's observation, the incision through the uterus and rupture of the membranes were followed instantaneously by the presentation of the placenta through the cut. In these cases the operation was performed before the occurrence of labor-pains, and the placenta separated long before the uterus was firmly contracted, so that the sudden diminution in intrauterine pressure was probably the essential cause.

So far no mention has been made of the antecedent changes in the *decidua serotina*, consisting in the formation of fissures and interstices in the deeper layers, as well as the pushing together and folding of the *decidua placentalis*, that Ruge has shown play such an important part in the process of separation under normal conditions.

From this brief sketch it will be inferred that the facts in our possession with reference to the normal process of placental separation are neither so few, nor so insignificant, as to justify the remark of Dr. Hart, that heads this note. Moreover, there is no apparent reason for the introduction of an hypothesis so long as the theories now held are so adequately explanatory of the phenomena. Dr. Hart's supposition is that "the placenta separates, not from diminution of the placental site, but during the expansion in area of this site after retraction."

It seems scarcely necessary to point out for the second time that placental separation is dependent in a much higher degree upon diminution of intrauterine pressure than upon any change in the uterine musculature, whether of retraction or contraction. If it be admitted that the placental site increases in area after retraction, the assumption is most extraordinary, even gratuitous, that the placenta is now unable to follow this expansion, when, a few seconds before, it could accommodate itself with ease to the diminution of area caused by the rhythmical contraction of the uterus. Failing the demonstration of its *raison d'être*, Dr. Hart's hypothesis requires no further consideration.

The interval between the birth of the child and the extrusion of the placenta by the hollow muscle of the uterus below the plane of the contraction-ring has been estimated by Schroeder at fifteen to twenty minutes for the majority of cases. Out of three hundred cases, in only twenty did this process require longer than one-half an hour, while in multiparæ the after-birth was often observed to pass the contraction-ring within one minute after the expulsion of the child. Ahlfeld fixes the average period at thirty minutes, while under certain conditions the membranes may remain above the contraction-ring as long as one and one-half to two hours.

The after-birth now lies in the lower uterine segment, the cervix, and the vagina, where it remains, if not expressed or withdrawn, for an indefinite period, until it is expelled by the force of gravity,—as when the woman assumes the sitting or erect posture,—or by the contractions of the abdominal muscles and the descent of the diaphragm, aided by the elasticity of the vagina. In this position the rhythmical contractions of the uterus are unable to effect its further extrusion.

There are two appearances in particular that indicate the descent of the placenta. Ahlfeld emphasizes the value of very gentle traction on the cord. But, as pointed out by Stratz, this symptom is only of decisive value when the original position of the placenta has been determined by the introduction of the hand within the vagina.

Schroeder describes as the safest clinical symptom the ascent of the fundus uteri and its diminution in volume, as well as the appearance of the characteristic fold, corresponding to the contraction-ring, between the fundus above and the distended lower uterine segment below. To perceive this sign, however, perfect familiarity with the contour of the uterus, considerable experience in abdominal palpation, and favorable conditions with respect to the relaxed state of the abdominal parietes are necessary.

ANTIPYRIN IN WHOOPING-COUGH.

ONE of the principal actions of antipyrin is the depression which it exerts on nerve-centres, diminishing the excitive motor power of the spinal cord. It has thus been employed with good results in various forms of inco-ordination and tremor, and since the glottic spasm of whooping-cough may be regarded as a form of inco-ordination, the use of antipyrin in this disease would naturally suggest itself. Considerable discussion is at present going on as to whether the priority of the use of antipyrin in whooping-cough is due to Dr. Genser, who read a paper before the

Society of Physicians in Vienna on April 13, 1888 (referred to more at length on another page), or to Dr. Dubousquet-Laborderie, who published his paper in the *Bulletin Général de Thérapeutique* on May 15, 1888. Without entering into the claims of either of these writers as to priority, although it may be mentioned here that Dr. Laborderie's paper was received for publication, according to *La Pratique Médicale*, July 31, 1888, one month before Dr. Genser's paper was published, it will be sufficient to call attention to the results obtained at their hands in the treatment of this affection.

Dr. Genser states that he has treated more than two hundred cases of whooping-cough on two entirely different plans of treatment. In one class various medicinal powders were employed after the method of Michael, by insufflation into the nasal fossæ. The other class was treated by the administration of the antipyrin given internally. The plan of insufflation was employed in seventy-six cases, the powder of benzoic acid being used. The results obtained were only passable, the average treatment lasting for forty-three days. About the only advantage of this treatment being that, as a rule, it suppresses vomiting, although this advantage is greatly counteracted by the difficulty of application and the high state of excitement which its employment usually occasions. On the other hand, antipyrin administered by the mouth was generally efficacious, the author's results appearing to show that this remedy not only diminishes the number of the spasms of coughing in the twenty-four hours, but also their duration and intensity. In the majority of cases the duration of treatment was not more than twenty-four days. The average dose was 1½ grains daily for each year of age, so that a child of 5 years of age would take in forty-eight hours fifteen grains of antipyrin given in syrup. In five cases complicated by pulmonary lesions this method only gave negative results.

Dr. Laborderie's results are even more favorable. In eleven cases he obtained a complete cure in twelve to sixteen days, although he lost one case, a little girl of 1 year of age, and one of 3½ years from capillary bronchitis and broncho-pneumonia. In these two cases, where the attacks came on forty to sixty times a day, antipyrin appeared to have no useful effect. He also had an incomplete success in a child who had forty to fifty attacks a day. This child, however, was rapidly cured when moved to the country. Finally, in a child 10 years of age the treatment had to be abandoned on account of nausea, diarrhœa, and gastric distress.

Dr. Laborderie always employs antipyrin without any other internal medication, although he makes use of fumigations of turpentine. The dose which he employs has been from 5 to 15 grains for children up to two years of age, and from 15 to 60 grains for elder children and adults. He gives it in Vichy water flavored with raspberry syrup. He recommends that the patients, after receiving this medicine, should take a little milk or soup. He claims that children with rare exceptions support this method of treatment. It is not dangerous; it is easy to administer and to oversee; the spasms were rapidly calmed, and the period of decline occurs within a few days.

Special attention should, however, be given to obtaining a perfectly pure article, and it is advisable to have it repurified and subjected to new crystallization.

Dr. Geffrier likewise publishes in the *Revue Générale de Clinique et de Thérapeutique* for August 2, 1888, a number of cases, which appear to show that antipyrin is extremely efficacious in reducing the number and severity of the paroxysms, and in certain cases will produce rapid arrest of the affection.

As to the mode of action of this remedy but little can be said. If we admit that whooping-cough is due to the action of a specific micro-organism, we might perhaps attribute these favorable results to its antiparasitic action. A more rational explanation would, however, seem to be found in the diminution of reflex excitability from the antiseptic properties of the drug. Antipyrin consequently cannot be regarded as a specific for whooping-cough, but the results published by these various observers are so striking as to certainly encourage a further employment of the remedy in this tedious affection.

In conclusion, we would call attention to the statement of Mr. F. E. Manby in *The Practitioner* for August, 1888, which confirms the statement already published in the GAZETTE as to the value of sulphurous acid fumigation in whooping-cough.

The method, which we may recapitulate, is the following:

"The children are in the morning put into clean clothes and removed elsewhere. All their clothes, toys, etc., are brought into their bedroom, and sulphur is burnt upon a few live coals in the middle of the room. The fire is allowed to remain in the room for five hours, and then the windows and doors

are thrown open. The child sleeps in the room the same evening. About twenty-five grammes (a little under an ounce) of sulphur to every cubic metre may be burnt; this is equivalent to rather more than ten grains per cubic foot. As the additional precaution was taken of having the day-room fumigated in a like manner during the night, the children practically lived in an atmosphere of diluted sulphurous acid gas for some days."

Mr. Manby claims that in every instance, without exception, his observation leads him to look upon the method as a practical cure in whooping-cough; the cough is lessened in frequency, expectoration of the thick clogging mucus much facilitated, paroxysms lessened in violence, and sickness after them as a consequence scarcely known. The children pick up quickly, and in no case has the cough lasted in its form of reduced violence more than a fortnight after the treatment commenced. The action of sulphur can scarcely be attributed to any thing but its germicide properties, so that the natural inference would be to combine sulphurous fumigation, which at best can do no harm, with the internal administration of antipyrin.

THE ACTION OF DRUGS UPON THE LIVER.

FROM time to time much work and ingenuity has been devoted by physiologists in the endeavor to determine, through experiments upon dogs, the effects of various agents upon biliary secretion. A recent elaborate research of this character, made in the University of Geneva, by Professor J. L. Prevost and Dr. Paul Binet, seems to require editorial notice in the columns of this journal. The studies were made upon two dogs, in which biliary fistulæ had been successfully created. It was found that the dogs remained in fairly good health for many months; fatty matters were kept out of their food: for aught we know the beasts are still familiar spirits in the Geneva laboratory. It was found that there is a distinct deficiency in the digestion of fats when the bile is allowed to escape from the body. Thus, when one of these dogs was given about an ounce of fresh butter, fifty per cent. of it was obtained from the grayish fatty stools. In regard to the effect of food upon the biliary output, it was noted that while the digestion of an ounce of fresh butter did not effect the secretion of bile, half an ounce of peptone, or a dish of soup to which peptone had been added, produced an immediate marked increase; in fact, doubling the normal secretion. Large quantities of warm water taken by the mouth produced a moderate increase, while moderate amounts of hot or cold water had no effect, nor had the injections into the intestines of as much as 120 c.c. any influence. The injection of bile into the blood-vessels produced a marked increase in the biliary secretion, which was evidently largely or altogether the result of the effort towards an elimination of the bile from the blood. Since when ox bile was injected the excreted bile contained abundance of glycocholic acid, which does not exist normally in the bile of the dog.

The substances which have been examined by Prevost and Binet in regard to their action may be divided into four groups.

GROUP I.—Substances which distinctly increase the biliary secretion:

Oil of turpentine and its derivatives: terpinol and terpine.

Chlorate of potassium.

Benzoate and salicylate of sodium; salol.

Euonymin.

Muscarine (subcutaneous injection).

GROUP II.—Substances whose action upon the biliary secretion is inconstant, although commonly they slightly increase it:

Bicarbonate of sodium; sulphate of sodium.

Chloride of sodium; Carlsbad salt.

Propylamine.

Antipyrin.

Aloes; cathartic acid; rhubarb.

Hydrastis canadensis; ipecac; boldo.

GROUP III.—Substances which decrease the excretion of bile:

Iodide of potassium.

Calomel, which, in the absence of bile in the intestine, colors the stools green.

Iron and copper (in subcutaneous injection).

Atropine (in subcutaneous injection).

Strychnine (in toxic doses).

GROUP IV.—Substances which are without action on the biliary secretion:

Phosphate of sodium; bromide of potassium.

Chloride of lithium.

Corrosive sublimate.

Arseniate of sodium.

Alcohol; ether; glycerin.

Quinine; caffeine; pilocarpine; kairin.

Cytisin; senna; colombo.

The following substances were found by Prevost and Benet to be excreted by the liver:

Oil of turpentine; terpinol; terpine.

Salicylic acid; also found after the ingestion of salol.

Bromide and iodide of potassium.

Chlorate of potassium.

Arsenic.

Iron (traces); lead (traces); mercury (traces).

Caffeine (results simply probable).

Fuchsine; cochineal.

Bile.

The following substances have a negative result:

Antipyrin and kairin.

Benzoic acid.

Quinine.

Strychnine.

Copper.

Lithium.

Urea.

Although much physiological interest attaches to such researches as those of Prevost and Binet upon the hepatic organ of the dog, we do not believe they are of much practical value to the clinician. Considerable discretion is always necessary in the application of the results of animal experimentation to the actual treatment of diseases, but here caution must be excessive. It seems to be a general law that when any system is in different species of animals similar in its functional activity, it is also similarly affected by drugs. Thus, the circulation of the dog is in all its functional activities closely parallel to the circulation in man, and the drug which modifies the circulation of the dog similarly influences the circulation in the man. On the other hand, systems which are essentially different in their functional activities are differently related to drugs. Thus, the digestive apparatus in the dog is in many respects very different from the digestive apparatus in the man. The dog is a carnivor, the man an omnivor, and the relations of the digestive activities of the stomach to organic substances is different in the man and the dog.

In obedience with the law thus enunciated we find that purgatives often act very differently upon the dog than upon the man. Thus, we have given elaterium to dogs, commencing with small doses and increasing the amount until death resulted, and in no instance have we seen purgation. Would it be from such experiments a safe deduction for the clinician that elaterium is not a purgative? The subject of the action of drugs upon the human alimentary canal must be chiefly studied by experiments upon human beings, and much light might be obtained by carefully carried out simple experiments. Take, for instance, the subject of the action of calomel. Many years ago Michea made a series of experiments upon men, which to-day stand almost alone, and the repetition of which is urgently needed. The first point for the chemist to determine is whether the green or brown stools produced by calomel do or do not owe their color to the presence of mercury in them. Then, whether biliary pigment or biliary acid is or is not always present in the calomel passages. Then, how far other purgatives, resinous or saline, produce stools in which biliary products can be detected. Such a research should be supplemented by a study made upon the cases in which the well-known potter's-clay-colored stools existed, and were modified by mercurials. The actual chemical demonstration that the change of color produced in such stools by the exhibition of calomel would be an important addition to our knowledge. Along with this research there should be a review of the work of Dr. J. Zawadzky (*Bul. Thérap.*, 1887), who came to the improbable conclusion that bile is present in the stools produced by calomel, because the antiseptic property of mercury presents the decomposition of biliverdin. Occasional cases of intestinal fistula occur in man, and a chemical study of the results of the exhibition of mercurials in one such case would be very valuable.

THE VENOM OF THE RATTLESNAKE AND THE GILA MONSTER.

IN some recent numbers of that very lively publication known as *Forest and Stream* there has been a series of very clever (*Anglicé*) articles by Dr. H. C. Yarrow upon the poisonous reptiles of America, especially the rattlesnake and the Gila monster, *Heloderma suspectum*. In the chapters devoted to the discussion of the rattlesnake we find nothing that seems to require mention here except in regard to the treatment. It will be remembered that De Lacerda some years ago asserted that the permanganate of potassium is an antidote to rattlesnake venom, and that Mitchell and Reichert found that when the permanganate is mixed with the venom in a beaker glass it destroys its constitution. The value of permanganate as a practical antidote in snake-bite was studied by Dr. Yarrow by injecting the venom into the body of the animal, and shortly after-

wards injecting permanganate of potassium in immediate proximity to the original wound. A very important observation was made that if a ligature be placed around the leg of an animal, and a certain quantity of venom be injected below the ligature, followed by a solution of the permanganate, no poisoning resulted, but even a five per cent. solution of the permanganate was of no value if there were no ligature above the point of injection, although the permanganate injection followed the venom within less than half a minute. The number of experiments reported by Dr. Yarrow does not seem to us sufficient to allow of a positive conclusion, but they indicate that the permanganate is useful in snake-bite when the bite is so situated that it can be isolated by a ligature, and his directions "to tie a ligature tightly round the wounded part, incise it freely, and then inject as soon as possible permanganate of potassium into the tissues round the wound," is justifiable.

A second therapeutic point which needs comment is in regard to the application of pilocarpine. Dr. Robert Fletcher, in a paper published in the *American Journal of Medical Science*, in 1883, mentions a case reported by a French physician, in which very grave symptoms had developed after the bite of a viper, but were relieved by the administration of jaborandi. Led by this, Dr. Yarrow made a few experiments upon animals. Here we quote his own words:

"One more experiment was tried upon another rabbit, in which a fourfold lethal dose of the venom was injected, viz., 20 minims, followed by 60 minims at intervals of jaborandi, with 60 by stomach, the animal recovering perfectly. From the foregoing experiments with the fluid extract of jaborandi it will be seen that while this substance appears to have antidotal effects upon rabbits, in fowls it fails, as has already been stated, but it is intended to pursue this line of experimentation still further, especially with the active principle known as pilocarpine. It may be mentioned that a medical man of Washington City is so convinced of the efficacy of the jaborandi that he has offered himself for the purpose of an experiment with venom; and, in addition to this offer, the writer has received a communication from a person in Ohio also proposing to submit to the test. Until we have experimented further, however, the scientific devotion of these gentlemen will not be tried."

We do not ourselves believe that pilocarpine will prove to be of any value whatever in snake-bite. The number of vegetable, animal, and mineral antidotes which have been brought forward from time to time as antidotal to snake-bites is a measure of the despair of humanity and the uselessness of the various specifics. Last winter a Dr. Bechtinger, who has lived in tropical countries for many years, and had an enormous experience, brought what he stated to be a certain prophylactic antidote, obtained by him from a medicine family of Carib Indians. The antidote was given to two dogs, followed by the rattlesnake venom. The animal which had received a scarcely lethal dose of the venom died after many hours; the animal which received a large dose of the venom died promptly, and no further trials were made. Similar will probably be the fate of pilocarpine.

With the Gila monster Dr. Yarrow reached results which are at present difficult of explanation. He first endeavored to find authentic cases of Heloderma-poisoning. He says that Dr. R. W. Shufeldt, of the United States army, reports serious symptoms after having received a bite on the right thumb, but no permanent disability followed.

As the result of several years of inquiry, two cases of apparently well-authenticated deaths were obtained. As the journal in which these are published is rarely seen by the profession, we have appended an affidavit in regard to the first case, and a letter from Dr. Goodfellow, of Tombstone, Arizona, concerning the second.

The first account was secured through Dr. S. P. Guibersome, of Ventura County, Cal., and is as follows:

"G. J. Hayes, a miner in from the Frazer mine, says that in 1878, in Tip-Top Mining Camp, Arizona, he saw a Gila monster bite a man by the name of Johnny Bostick, who, at the time, was under the influence of liquor. That he took hold of the Heloderma and shoved his finger at it, and the reptile seized his finger, and its jaws had to be pried open before he could disengage his finger. The Heloderma was twenty-two inches long, and lay on the card-table. It was also seen by a man named Lou Smith and a lot of Italian miners. Immediately Mr. John Bostick drank large quantities of liquor, and from the effects of the bite one side was paralyzed, and he died in about three months, April 19, 1878. I hereby certify that the above statement is correct.

(Signed) "G. J. HAYES."

"TOMBSTONE, July 23, 1887.

"MY DEAR AINSWORTH,—I at last am ready to reply to your letter concerning 'snakes.' The Fairbanks case was as follows: Yeager, about 55 years of age, was, in May, 1885, in Fairbanks, Arizona Territory, bitten by a Gila monster. He, to prove the innocuousness of the beast, put his left thumb and forefinger into its mouth, and he was bitten. He was immediately loaded to the guards with whiskey,—it happened in a saloon,—and he seemed all right, save for a slight numbness and swelling in the hand and arm. He sat down in a chair in the saloon, talked with those around for an hour. The crowd thinning out, he seemed to drop asleep. In about an hour or more the saloon-keeper spoke to him; but not making a reply, he was taken hold of and found to be dead. I was sent for, but before I could leave received a second message announcing his death. He was a man addicted to the use of liquor, and, so far as I can ascertain, had been on a prolonged spree for months. Whether he died of the reptilian poison or a combination of whiskey, disease, and Gila monster, I cannot say.

"About four years ago, on the Lower San Pedro, I was informed that a man had been bitten in the foot while in the field, and died within three hours. I could neither prove nor disprove the case.

"That the Gila monster is a poisonous lizard cannot now be denied. That its bite is fatal uniformly is open to discussion.

"Very respectfully,

"G. E. GOODFELLOW."

Dr. Yarrow states that Mr. Horan, superintendent of the National Museum, has been bitten several times without serious results.

Dr. Yarrow, in order to obtain the poisonous saliva of the Heloderma, forced the lizard to bite on a piece of artist's rubber, which, being elastic and yielding, does not injure the teeth, and affords a fair hold. The saliva, after being swabbed up with absorbent cotton, was washed out in glycerin. Injections of the liquid thus obtained were made, and in one experiment a piece of absorbent cotton, containing from 15 to 20 drops of fresh saliva, was forced into a wound in the breast of a chicken, and allowed to remain until it became encysted In other experiments the Heloderma was induced to bite chickens or rabbits from which feathers or fur had been removed; in no instance was there any poisoning. Dr. Yarrow states that both his Gila monsters were good-sized, active specimens, full of vigor, secreting saliva freely, and had only suffered a short captivity. That the Heloderma saliva obtained by Mitchell was actively poisonous it seems to us there can be no possible doubt; and we are informed by Professor Reichert that he has a store of the dried saliva still on hand, and will be pleased to demonstrate to Dr. Yarrow its toxic properties.

The explanation of the failure of Dr. Yarrow is difficult. It is possible that the time of the year, or rather the temperature in which the animal is living, may have influence upon its secretion of poison. It is possible also that starvation may affect the secretion of the poison. The experiments of Yarrow were made in the month of November, but whether the reptiles had or had not been long without food is not stated.

Reports on Therapeutic Progress.

THE ACTION OF THE SULPHATE OF SPARTEINE.

LEVASCHEFF has undertaken a series of studies with the object of determining whether sparteine acts on the contractions of the heart, and if so, in what manner that action is produced; whether it is diuretic; if it acts favorably in cases of insufficiency in the contractions of the heart, in renal dropsies, and in the dropsies produced by hepatic cirrhosis: finally, he compares sparteine to the other cardiac diuretic remedies. Professor Levascheff formulates his conclusions as follows:

First.—The sulphate of sparteine has incontestably the property of reinforcing and regulating the contractions of a feeble or arhythmic heart, while at the same time slowing the pulse if that should be accelerated.

Second.—Sparteine increases the blood-pressure, and causes the disappearance of symptoms of blood stasis and œdema, thus acting favorably on diuresis. The respiratory movements, under the influence of this remedy, become slower and more regular.

Third.—Clinical studies have not yet determined a diuretic action for sparteine, and it is not yet known as to whether it possesses any direct action on the renal epithelium.

Fourth.—Sparteine is less active than the other cardiac tonics,—digitalis, adonis, and strophanthus.

Fifth.—In inveterate cases, where the heart-muscle shows symptoms of degeneration, or

where œdema is very excessive, sparteine is without effect, even although the other cardiac remedies may act in a more or less favorable manner.

Sixth.—Sparteine is indicated in recent cardiac affections, when compensation is but little disturbed and when the degeneration of the cardiac muscle is inconsiderable.

Seventh.—Sulphate of sparteine has a decided and yet not transient action on the heart, but this action is too feeble to produce well-pronounced therapeutic effects.

Eighth.—Sparteine acts very rapidly, fifteen minutes being sufficient to produce its characteristic action.

Ninth.—Thanks to this rapidity of action, sparteine has a certain value in cases of acute enfeeblement of the action of the heart, as is often observed in different infectious diseases.

Tenth.—Small quantities of sparteine (three-fourths of a grain daily) produced a therapeutic effect, but pronounced and constant action is not procured with doses smaller than from two to five grains daily. Larger doses do not produce more marked effects.

Eleventh.—The daily dose of sulphate of sparteine should be from three-fourths of a grain to five grains, taken in three or four doses.

Twelfth.—The inconveniences of sparteine are irritation of the mucous membrane of the intestine, and, as a consequence, diarrhœa, vomiting, and nausea.

PAWINSKI also reports the result of thirty-three observations of the clinical employment of sparteine, and he summarizes his results as to the action of sparteine on the heart as follows:

First.—In small doses, from ⅓ to ½ of a grain, or one to one and a half grains a day, it reinforces the action of the heart, the pulsations of the heart are slowed, the blood-pressure is increased, and the heart beats more regularly.

Second.—In moderate doses, 1 to 1⅓ grains, given at one time, no influence on the heart is manifested.

Third.—Individual doses of from 1 and 1⅓ to 2 grains, or up to fifteen grains a day, paralyze the heart, the pulse becomes slow, feeble, and the rhythm of the heart is disturbed. Small doses irritate the pneumogastric nerve; large doses paralyze it.

In all cases the action of sparteine falls below that of digitalis. Small doses increase the tonicity of the blood-vessels, this effect being evident thirty to forty minutes after its administration. No cumulative action was observed, and, contrary to the opinion of Levascheff, Pawinski has not found that it produces any gastric or intestinal troubles. Its diuretic power is feeble, and is manifested only in cases where there are organic troubles of the heart. According to Pawinski, the indications for the therapeutic employment of sparteine are as follows:

1. Nervous troubles of the heart. 2. In cases of painful and distressing sensations in cases of valvular diseases of the heart. 3. At the commencement of Graves's disease. 4. In the asthmatic attacks of bronchitic and emphysematous subjects. 5. In cases where digitalis is not supported.—*Bulletin Général de Thérapeutique*, July 15, 1888.

MERCURIALISM IN LYING-IN WOMEN.

At a meeting of the Obstetrical Society of London, held July 4, 1888, a paper on the conditions which favor mercurialism in lying-in women, with suggestions for its prevention, was read by Dr. BOXALL (*Brit. Med. Journ.*, July 14, 1888).

The question was debated under two separate headings: (1) increased absorption; (2) defective elimination. Under the first head, the site of absorption was discussed; the question whether the solution obtained entrance to the cavity of the uterus when the uterine-tube had not been employed was debated, and an experimental investigation undertaken with a view to determine the point was related. It was suggested that absorption not infrequently occurred inside the uterus, even when the uterine-tube had not been employed, but that it might also take place through the lacerated surfaces of the cervix, vagina, and perineum, or even through the intact mucous membrane. Reference was made to the experimental research conducted by MM. Doléris and L. Butte which bore on this point. With a view to diminish the risk of absorption it was suggested: 1. That not only should care be exercised to obtain contraction of the uterus, but that it should be also carefully maintained, and, above all, that the douche should always be given at such a temperature as would stimulate the uterus to action. 2. That the douche should invariably be administered in the supine position, the uterus at the same time being supervised by one hand placed on the abdomen. 3. That, when the administration was completed, the precaution should invariably be taken of as-

certaining that the uterus was contracted by palpating the abdomen, and, if distended, the fundus should be squeezed like a sponge in the palm of the hand, and at the same time should be depressed with the object of evacuating the vagina. 4. That the surface of lacerations about the external orifice should be brought together, and any abrasions which remained should be coated with some material impervious to the solution. Under the second head, the relative eliminative power of the different excretory organs was discussed, and especial attention was directed to the condition of the kidneys and intestine. The following suggestions were offered: 1. That chronic nephritis, and probably also those changes which occurred in the kidneys during pregnancy, might, by diminished elimination, produce an accumulation in the septum. 2. That the intestine possessed an equal if not a greater eliminating power than the kidneys. With a view to obviate the risks arising from defective elimination,—1. That, when the kidneys were affected, the sublimate douche should not be employed, or, if used, extreme caution should be exercised. 2. That a free watery flow should be promoted by the kidneys, and that especial care should be directed to this point in hot weather. 3. That the bowels should be evacuated daily, either by salines or by the administration of such agents as produced copious and loose stools. A tabulated series of eleven cases which presented symptoms of slight mercurialism was appended. A fatal case of mercurialism was also narrated.

Dr. Matthews Duncan called attention to the easy distention of the puerperal uterus by injections, even long after delivery. Distention shortly after the birth of the child, as in *post-partum* hemorrhage, was better known. Dr. Boxall had apparently overlooked a mode of conveyance, otherwise than by absorption, into the circulation. This was easily understood after delivery, when there were open sinuses at the placental side; but it might take place in the unimpregnated uterus, as Dr. Duncan had shown in a case of injection of a solution of perchloride of iron. The sudden deaths on injection of that agent were to be explained only in this way. The fluid entered in bulk, not by absorption.

Dr. Routh considered that Dr. Boxall's paper was admirable. Nevertheless, he thought that the routine practice of sublimate injections was carried too far. In one of the recorded cases the redness of the gums on the third day might not have been caused by the sublimate, but the mercurial symptoms came on by the sixth day. This proved that they were due to the prolonged use of the sublimate injections. The strength of the solution was reduced to 1 in 4000 after the third day. This practice, however, might cause the evil it was designed to avert, for a weak solution could be readily absorbed; a stronger preparation would coagulate the albumen and thus stop the mouths of the absorbing vessels, preventing the entrance of septic substances from without. The cases where he had seen nephritis and albuminuria following this absorption were precisely those where weak solutions had been employed. Dr. Routh recorded the case of a patient who, in consequence of pendulous abdomen, had gone one month beyond the usual term of gestation. Septicæmic symptoms occurred at the end of every week for four consecutive weeks. Iodine injections always removed the serious symptoms, but, as they recurred so often, he used a corrosive sublimate injection, one grain in two ounces of water at the end of the fifth week. A considerable quantity of albuminous flakes came away, and the patient made a perfect recovery. In ordinary cases Dr. Routh preferred iodine vaginal injections, thirty drops of the tincture to half a pint of warm water, the water being as hot as the patient could bear, whenever there was any smell. He believed that the hot water alone coagulated the albumen and destroyed germs. Only when there were feverish symptoms threatening septicæmia was it necessary to inject the uterus. A strong solution of the perchloride, 1 part in 960 at least, should then be used. Dr. Routh thought that the volatility of iodine was an advantage. It could penetrate tissues where sublimate could not enter. He noted what was seen in a necropsy on a case already recorded by Dr. Grigg, where septic symptoms had occurred, and sublimate injections had been used. The mercury had only acted on two-thirds of the uterine cavity, which was white and sweet. The upper third was in a gangrenous condition. Iodine would have reached every part of the uterus.

Dr. Samuel Sloan (Glasgow) favored the abolition of the routine practice of vaginal injections in natural cases. He had discontinued routine injections, both in private and in hospital practice, for some years, and since then his results were better than before. He could not say whether this signified that injections interfered with natural processes, or that it was difficult to keep the tubes, etc., used in routine injections absolutely clean.

When any cause for suspecting septæmia or septicæmia arose, he then used mercurial injections, but in private practice this was an extremely rare event. In such cases, however, mercurialism was most unlikely to occur, because the need for the drug would diminish its activity. Dr. Sloan did not advise the discontinuance of antiseptics in hospital practice, but he objected to the routine use of injections even there. In private midwifery practice he had to a large extent given up antiseptics, for he believed that women could be kept aseptic by absolute cleanliness, healthy surroundings, and skilful management during pregnancy, labor, and the puerperium, their resisting power being at its maximum, and the tendency to decomposition at the minimum; the lochia did not naturally decompose. When mercurial injections were skilfully given, ballooning of the uterus could not take place. The organ must be firmly grasped by the hand during the process of injection, and by pressing back the perineum while the woman coughed, retention in the vagina was avoided, especially if the patient were placed in the semisupine position.

Dr. Champneys thought that the days were past in which a speaker who talked about "antiseptics in midwifery not being necessary" would find supporters in the society. There was some difference of opinion as to routine injections. Sepsis had for some years been entirely abolished at the General Lying-in Hospital. Dr. Sloan did not appear to have been so successful in his own practice at Glasgow. Dr. Champneys thought it strange that anybody should be accused of want of care by a gentleman who attributed his own results to "dirty enemas." Routine use of vaginal douches might not be absolutely necessary, in private at least; they were far less important than antiseptic cleanliness of the hands. Still, Dr. Champneys had used routine douches for years and years, and was more satisfied than ever with them; they proved beneficial in several ways. The material to be used for the injections was open to debate. In ordinary cases he did not use sublimate on account of the risk of mercurialism, and a weak antiseptic such as iodine would probably suffice, except in special cases, at an institution like the General Lying-in Hospital, where the midwives and nurses so thoroughly understood the antiseptic system. Dr. Champneys did not see how the semiprone position could be the best, when vaginal injections were employed. It was highly inconvenient; the bed could with difficulty be kept dry, and gravitation of the injection into the uterus and subsequent absorption would be favored rather than prevented. He regretted to hear about the "germ-resisting power" of a woman. In the old days before antiseptics young, healthy women succumbed in large numbers to puerperal fever.

Dr. Herman had noted, in his own experience, a frequency of mercurialism nearly the same as in Dr. Boxall's series of cases. As suming idiosyncrasy was the reason of the mercurialism, it appeared that this idiosyncrasy was present in about five per cent. of all cases. Dr. Herman could not trace any connection between the weather and the occurrence of mercurialism. He had seen a temporary trace of albumen in the urine in only two out of the eleven cases of mercurialism in his own hospital (referring to one hundred and eighty-two patients admitted into the General Lying-in Hospital in the first half of 1886; in two of the eleven cases it was not certain that the symptoms were really due to mercury). In two cases of Bright's disease during pregnancy, sublimate douches, administered as in all the other hospital patients, had caused no symptoms of poisoning. Anæmic patients were not specially prone to mercurialism. Altogether, perchloride of mercury was the best antiseptic in hospital practice. It was not so safe in private cases, except under two conditions: the nurse who gave the douche should know the dangers of ballooning of the vagina and how to prevent it; secondly, the obstetrician should attend the case at least daily, so that he might perceive the first symptoms of mercurialism. When he ceased his daily visits, the use of sublimate should be left off. "Germ-resisting power" must not be trusted. He could not offer information as to the effect of sublimate douches in septicæmia, for during the two years and a half he had been attached to the above-named institution there had been no case of that complication.

Dr. Cullingworth laid greater stress on cleanliness of hands, instruments, sponges, and everything brought into contact with the genital tract, than on uterine and vaginal injections. It was questionable whether germicide solutions should be introduced into the body of the patient. It was not the organisms already there, but those which might be introduced from without, which were to be feared. To prevent the ingress of the latter was the object of antiseptic midwifery; this object was obtained by efficient disinfection

of the hands, instruments, etc., by processes which did not involve any danger of mercurialism. The antiseptic method must not be made too complicated, else practitioners could not adopt it. Warm vaginal injections were both soothing and useful; they, above all, promoted cleanliness, which could be obtained by harmless ingredients as easily as by poisons like sublimate. Even in cases of septæmia, where at least one thorough intrauterine injection was of value, milder chemical agents than sublimate were probably sufficient. Chemical products of decomposition probably caused the harm in these cases, as the symptoms disappeared as soon as the uterus was emptied. When septicæmic symptoms had developed, it was useless to employ sublimate, for no douche could reach germs which had already entered the circulation.

Dr. Leith Napier thought that, in private practice, a hot saturated solution of boracic acid was best for douches. In hospitals, sublimate solutions were suitable, but they should be very dilute. Strong preparations coagulated albumen. It seemed better to employ a solution which, by absorption, might act generally as well as locally. He thought that mercury was eliminated not only by the intestine (where the unabsorbed portion was found as an insoluble sulphide), but by all the secretions.

Dr. Routh here observed that during convalescence he almost invariably employed iodine or Condy's fluid for vaginal injections, and that as to the good effect of the mercurial solution (which Dr. Cullingworth doubted) in the septic case, "the proof of the pudding was in the eating," as complete cure occurred.

Dr. Lewers said that during the year 1887 nine hundred and sixty-two women had been delivered in Queen Charlotte's Lying-in Hospital, with only two deaths.

Dr. Boxall then replied. He thought that the direct passage of sublimate into the system was quite exceptional, and occurred when other antiseptics were used. In the rules for the administration of the douche, included in his paper, he had made allowance for ballooning of the vagina and uterus. The coagulating action of sublimate did not necessarily imply that its antiseptic influence was strictly local, still less that absorption of mercury was prevented. The coagulum at first formed was soluble in excess of albumen. Sublimate brought into contact with albumen was at first precipitated, and mercury in considerable quantity might thus be retained within the passages. But the action of the albumen of the blood and tissues dissolved the coagulum, which was then liable to be absorbed. The primary precipitation of the mercury tended to retention (hence a further reason, were any needed, for complete evacuation of the uterus), whereas the faculty for being redissolved might ultimately result in a large influx into the tissues. Whether the solution of albuminate in excess of albumen was itself a reliable antiseptic required elucidation. In conclusion, Dr. Boxall insisted on the superiority of perchloride of mercury over iodine and other antiseptic agents.

THE TREATMENT OF WHOOPING-COUGH BY NASAL INSUFFLATIONS AND BY THE INTERNAL USE OF ANTIPYRIN.

According to the Vienna correspondent of the *New York Medical Journal* (July 28, 1888), Dr. von Genser recently read a paper "On the Pathology and Treatment of Whooping-Cough" before the Imperial Royal Society of Physicians of Vienna. He first discussed the etiology of this frequent disease, and particularly recent investigations going to show that it was a parasitic affection. Speaking of the recent work of Afanssiew on the *Bacillus tussis convulsivæ*, the author of the paper said that a permanent value must be accorded it. As to the treatment of this affection, he had availed himself of two methods on two hundred children. The first method was that recommended by Michael, of Hamburg, viz., the insufflation of medicaments into the nose, and the second was the internal use of antipyrin. Michael, who considered whooping-cough as a reflex neurosis, was accustomed to order the insufflation, during a period of twenty-four hours, of a powder composed of one part each of powdered gum benzoin, sulphate of quinine, and nitrate of silver, and thirty parts of calcined magnesia. He had stated that he had obtained very favorable results in the great majority of his cases; that in seven per cent. the disease had disappeared in from two to three days. The author of the paper had employed this method in thirty-six cases, and had insufflated the benzoin powder into the nose by means of a curved glass tube. The number of paroxysms daily was shown by means of curve-tables. The spasmodic stage was considered as the beginning of the disease. His curves had never been quite satisfactory, and he had never observed any such surprising successes as had been obtained from this treat-

ment by Michael. The duration of the treatment had varied from nineteen to eighty days, the average having been forty-three days. The sole advantage of the method consisted in the fact that severe vomiting could immediately be stopped. On one occasion he had insufflated with quinine, but the child thus treated had instantly been seized with vomiting. The insufflation of antipyrin irritated children very severely; they were seized with severe cough, and the results were by no means favorable, nor the successes numerous.

In the employment of the second method, he had prescribed the internal use of antipyrin to about one hundred and twenty children, a grain and a half of the drug daily being ordered for each year of age, so that a child of the age of five years was ordered to take fifteen grains of antipyrin, in three ounces of water and syrup, in the course of two days. Sonnenberger had recently reported favorable results from the internal use of antipyrin, and the author was able to confirm this statement quite emphatically. The paroxysms diminished considerably in number, and the individual attacks became shorter in duration and less intense. The duration of treatment had varied between fifteen and forty-five days; hence the average had been twenty-four days and a half. In five cases where the lungs were implicated the antipyrin had proved ineffectual. The drug was very useful and worthy of recommendation in cases of whooping-cough, and children took it willingly enough, as its bitter taste could easily be disguised. Its effect was either an antimycotic one—that is, destroying fungi that were present—or else a sedative one,—it diminished the reflex irritability. It was, indeed, no specific against whooping-cough, but, on the other hand, it was quite harmless. General hygienic measures, of course, are also needed to be observed as a part of this course of treatment. As to the experiments with acetanilide, which the author had also carried out in the treatment of whooping-cough, they had not proved satisfactory; the drug was not so efficient as antipyrin.

THE COMPARATIVE VALUE OF CODEINE AND MORPHINE IN THE TREATMENT OF DIABETES.

In the GAZETTE for March 15, 1887, we published an abstract of a paper by DR. J. MITCHELL BRUCE as to the value of morphine in the treatment of diabetes. In the *Practitioner* for July, 1888, he publishes the conclusions of his studies made on this subject, comparing the value of morphine in diabetes with codeine. His studies were made on two classical cases of diabetes which were under treatment in the Charing Cross Hospital at the same time, and, extending over many months and conducted with the greatest care possible, afforded an interesting opportunity of comparing the progress of the patients under these different methods of treatment. The plan of investigation was first to place the patients on strictly antidiabetic diet, without medicine, and to keep them on this only as long as the sugar continued to fall. When the amount of sugar had reached a minimum, and remained near or at that level for several days, the influence of drugs was then tested. Codeine in the form of the phosphate was first given, beginning with small doses and gradually increasing the amount exhibited until its effects appeared to have been fully ascertained. The drug was then slowly reduced in dose, and finally removed. After an interval of about a week (on strict diet and camphor-water), which was sufficient to restore the patient to a condition of sugar-equilibrium, morphine in the form of the acetate was commenced, and the dose, at first small, was steadily pushed, as with the codeine, as long as obvious effects continued to be produced on the excretion of sugar. It is difficult to conceive any method of clinical investigation more likely than this to give an impartial answer to the inquiry as to the relative value of the two alkaloids.

In both cases pyrogallic acid was given for a short time before the codeine, for the purpose of trying whether any result could be obtained from the use of safe doses of a substance that has been proved by Dr. Noel Paton to have a powerful influence on the excretion of urea. No definite effect of pyrogallic acid on the glycosuria was discoverable in these two cases, and it was not pushed. A careful examination of the charts will convince the reader that the introduction of this drug at this stage in no respect vitiated the plan of observation.

Codeine was given to both patients in the form of the phosphate, as being the salt of the alkaloid most suitable for administration hypodermically, had the investigation extended then or at some future date to an observation of the effect of this drug given under the skin. The phosphate of codeine, which contains seventy per cent. of the alkaloid, was administered in simple aqueous solution; the acetate

of morphine as liquor morphinæ acetatis in water.

Full notes of the continued progress of these two cases are published, and they show that they were cases of genuine diabetes, continuing to excrete seventeen hundred and ten to two thousand one hundred and thirty grains of sugar on strictly antidiabetic diet.

Pyrogallic acid had no discoverable influence on the disease; but the small doses in which the drug was exhibited, as compared with those given to dogs by Dr. Noel Paton, could hardly have been expected to produce a marked effect on metabolism.

Phosphate of codeine made an impression on the urine, diminishing the volume, lowering the specific gravity, and reducing the amount of sugar.

The maximum result was obtained about the fifteenth day of its administration, when no less than twenty-seven grains of the drug were being taken *per diem* by the man, twenty-two grains by the boy. The sugar was never completely removed from the urine of the man, the minimum excretion being six hundred and twenty grains *per diem*. In the case of the boy the sugar disappeared for one day only, rising on the next day to three hundred and forty grains. Therewith the body-weight in the case of the man had risen from eight stone ten pounds to nine stone two pounds in the course of seven weeks, and the physical vigor increased at the same time. The activity of the nervous system was but slightly impaired: there was only occasional diurnal sleep, but the boy frequently complained of headache. The appetite continued good, the thirst moderate. But in spite of the very large doses given, the codeine had not afforded complete control of the glycosuria, and there was occasionally considerable increase of the excretion,—thus on March 18, 1887, when twenty-eight grains were being taken, nine hundred and thirty grains of sugar were passed. It is possible that if the dose had been pushed still higher, say to forty-five grains *per diem*, as given by Dr. Cavafy, the glycosuria might have been entirely arrested.

With the gradual reduction of the dose of the codeine the sugar steadily rose in amount; a further proof of the influence of the drug.

The effect of acetate of morphine upon the excretion of sugar was even more striking than the effect of the codeine,—certainly more rapid and more powerful. The sugar fell steadily in amount, and finally completely disappeared when 5.8 and 6.3 grains, respectively, of the salt were being given *per diem*. The volume of urine declined from seventeen hundred to one thousand cubic centimetres in the boy, from two thousand four hundred and fifty to eighteen hundred cubic centimetres or less in the man; the specific gravity was lowered from 1046 to 1020 in the boy, from 1034 to 1012 in the man. The patients' condition otherwise underwent a corresponding improvement: the boy gained four and a half pounds in weight, the man seven pounds, and they expressed themselves as feeling in excellent health. Most important of all from our present point of view, the patients were never found sleepy or heavy or dull during the day, but, on the contrary, bright, cheerful, and vigorous. Indeed, it appeared as if the older patient suffered from insomnia, for he complained that he did not sleep more than three or four hours during the night. The pupils were slightly contracted in both cases; the boy continued to suffer from headache.

In his comparison of the relative values of codeine and morphine in the treatment of these cases, it would seem that the results are decidedly in favor of morphine.

Three tests may be applied: (1) the test of power; (2) that of cost; and (3) that of safety.

First, of the two drugs, morphine proved to be unquestionably the *more powerful*. It completely removed the sugar from the urine in both cases, which codeine did not; and when the excretion was greatly reduced, morphine obviously controlled it more completely than codeine, under which occasional increases of the sugar occurred.

Secondly, the *amount* of morphine required to produce the maximum amount of benefit was but one-fourth that of codeine. The best effect was obtained from about six grains of acetate of morphine *per diem;* from phosphate of codeine, not until about thirty grains (equal to twenty-one grains of codeine) were being given *per diem*. This is what might have been anticipated from our knowledge of the relative doses of the two alkaloids, but it is a very important fact, nevertheless, from the point of view of *expense*. Codeine costs eighteen shillings per ounce; acetate of morphine costs but five shillings ninepence per ounce. A patient consuming six grains of acetate of morphine *per diem* would therefore be treated at about one-twelfth the cost of another taking twenty-one grains of codeine.

Thirdly, the important question remains to be discussed whether the *drawbacks* connected with the exhibition of very large doses of morphine in diabetes are not greater than those which attend codeine. Dr. Pavy appears to

have been of this opinion, as the result of his hospital experience, recorded in the paper already referred to, and which must be regarded as the source from which most of our recent writers on the treatment of diabetes by codeine have drawn either their information or the suggestions for their personal observations. Dr. Bruce, however, states that in the cases of diabetes treated with morphine or opium narcotic symptoms have rarely presented themselves as long as the sugar continued to fall, although he has found very decided evidence of the cerebral action of morphine in diabetes when the hypodermic method was employed. Further, the charts which Dr. Bruce publishes show that, while both codeine and morphine had been given for a long time and in large doses before the sugar was reduced to a minimum, the difficulty chiefly consisted in removing the last traces, and he suggests that in routine practice we should be satisfied with the reduction of the amount of excretion to a small degree rather than push it by giving the large doses which are required to completely remove the sugar. Lastly, it is only claimed that the result of these drugs is favorable when combined with rigid dieting.

ANGINA PECTORIS OF SYPHILITIC ORIGIN.

This, M. Hallopeau remarks, must be considered a rare affection, for among recent special works that of Rumpf (*Die Syph. Erkrank. des Nervensystems*) appears to be the only one that mentions it. But syphilitic angina may perhaps be found to be not so uncommon when attention has been drawn to the subject. Of two hundred cases of angina pectoris observed by M. Huchard (*Bull. et Mém. de la Soc. Méd. des Hôpitaux*, 1887), for example, forty-three were cured by treatment with iodides, and M. Hallopeau finds it difficult to believe that some at least of these were not syphilitic. But all the cases given by Rumpf as angina pectoris cannot be definitely accepted. Almost all of them, indeed, are examples of pain and dyspnœa in connection with valvular disease of the heart or tumor of the myocardium. The symptoms are those of heart disease, and do not constitute an idiopathic affection, like the true angina pectoris. Of this kind also are the cases recorded by Ricord, Lancereaux, Virchow, Teissier, Balzer, and Ehrlich. Angina pectoris is not to be looked upon as due to syphilis simply because the patient happens to be syphilitic, and it seems very doubtful whether the following case of Rumpf's can be considered really syphilitic: The patient was a woman, aged 64, who had had an indurated chancre thirty years before. Latterly she had been attacked by a feeling of oppression in the region of the heart, accompanied by shooting pains, which came and went suddenly without extending down the arm. At the autopsy there were found some small scars in the substance of the ventricles, together with atheroma of the coronary arteries and their branches, and slight dilatation of the aorta. Iodide of potassium had been given without effect. Another case of Rumpf's, however, is satisfactory: A man, aged 29, had attacks of intense pain in the præcordial region. The pain was of a darting kind and extended down the back and the left arm, and was accompanied by a feeling of pressure and constriction and intense anxiety. At the end of the attacks there was palpitation, and the pulse was raised to 120 per minute. The seizures at first came on only rarely, then every other day, and latterly nearly every day, most frequently in the afternoon. The man had had a sore six years previously, followed by eruptions on the skin and sore throat. Examination of the heart revealed nothing abnormal beyond accentuation of the second sound over the pulmonary artery. Under treatment by iodide of potassium and cold applications complete recovery took place, and when the man was seen by Rumpf several years afterwards there had been no return. The rapid cure under iodide, remarks M. Hallopeau, and the history of syphilis in this case, leave little doubt as to the syphilitic nature of the affection, especially as the age of the patient would exclude the existence of atheroma of the coronary arteries. Another remarkable case of a similar kind is recorded by Vitone (*Il Morgagni*, 1886): A man, aged 34, contracted syphilis four years ago; one year later he suffered from deep lancinating pains in the lower limbs, and in April, 1885, had attacks of pain in the præcordial region, the left side of the chest, and the left arm. The attacks occurred several times daily, and were accompanied by difficulty of breathing and a feeling of suffocation. Their duration was short, and they were sometimes attended by increased heat and hyperidrosis of the whole of the left side of the body. The attacks came on more frequently before than after a meal, and during the seizure the patient became pale and pressed his hand to his chest. If he

happened to be walking, he was obliged to stop. Examination of the heart revealed nothing abnormal. The man had suffered from the effects of malaria as well as from syphilis; but while quinine had no effect whatever on the attacks of angina, they rapidly yielded to the subcutaneous injection of mercury, and on the sixth day of this treatment ceased altogether. Vitone has since published a second case of cardiac trouble due to syphilis (*La Terapia Moderna*, 1886). There were attacks of pain in the cardiac region, which came on several times a day, without any appreciable signs of organic disease. Cure resulted in this case also under mercurial treatment; but the resemblance to angina pectoris was not so well marked as in the previous case. M. Fournier has also told the author of a case of a young woman who was suffering from secondary syphilis, and who had symptoms like those of angina pectoris, which rapidly disappeared under the influence of mercury. The following case was under M. Hallopeau's own care: A gentleman, aged 36, contracted syphilis in 1867, which ran an ordinary course under treatment by mercury and iodide of potassium. From 1871 there were no more symptoms until August 19, 1878, when the patient was awakened during the night by an agonizing sensation in the region of the heart, and radiating towards the left shoulder. The attack lasted only a few instants. On the 20th there were two similar attacks in the night and one during the day. Examination of the heart revealed nothing abnormal, and the general health was good. The patient was of arthritic diathesis, and had suffered from asthma up to the age of 25, and since then had had subacute rheumatism and gout. He was also subject to attacks of migraine, eczema, and piles, and had been overworked of late. The cardiac attacks always began with præcordial oppression, accompanied by abnormal sensations, which the patient described as disagreeable and distressing rather than actually painful; they radiated towards the left upper limb, sometimes extending only as far as the shoulder, sometimes to the elbow, and sometimes to the fingers. On each of the two following days there were four attacks. On the 23d a blister was applied over the heart, and 1 drachm of bromide of potassium daily was prescribed. There was no further attack until the 30th, from which date, with the exception of an interval of five days, the seizures occurred sometimes daily and sometimes several times a day in spite of treatment of various kinds, including galvanism and the actual cautery, till October 15. During this period the seizures had from time to time altered in character, various other morbid sensations—for example, a feeling of constriction in the neck and epigastrium, shivering of one side of the body, giddiness, numbness, and paresis of the right foot—having been in turn complained of. On October 15 iodide of potassium (45 grains) was prescribed. From this time the attacks diminished, and six days afterwards ceased altogether. When M. Hallopeau saw the patient nine years later there had been no return. The author ends his paper with the following propositions: 1. Syphilis in its secondary and tertiary stages may give rise to attacks of angina pectoris. 2. The attacks may form typical examples of that affection. 3. In some cases they are complicated with other disorders of innervation connected with reflex excitation of the vaso-motor nerves, and thus give rise to abnormal sensations of cold or heat in one-half of the body, with shiverings and hyperidrosis, or to paresis by ischæmia of the motor centres. 4. The attacks are connected with the development of specific neoplasms in the course of the cardiac plexus or in its immediate neighborhood. 5. They may change their character according to the evolution of the lesions, by their disappearance from the points first attacked, and by their extension to other branches of the sympathetic. 6. They may be cured in a few days by mercury or iodide, and may never return.—*London Med. Recorder*, June 20, 1888.

THE ALKALINE TREATMENT OF ECZEMA.

Acting on the principle that acids applied to an acid-secreting surface and alkalies to an alkaline surface diminish the respective secretions, DR. T. FREDERICK PEARSE states in the *Lancet* for July 14, 1888, that he has treated cases of eczema for many years by alkaline applications. It may be termed unphysiological, and that the morbid exudation of eczema has no parallel with the normal secretion of glands. The answer is in the results. There is not the slightest doubt that an acid applied to an eczematous surface will irritate and increase the exudation, and he is satisfied that alkalies judiciously applied will have a contrary effect. Whatever views we may have on the pathology of eczema, the great diversity of methods shows that we have no definite *rationale* of treatment. At the same time,

the writer does not argue that alkalies have any "specific" action. No one who has seen much of eczema can doubt that the associated disorder to which these patients are subject is that connected with their digestive organs. The internal treatment is undoubtedly of paramount importance. The one thing, also, which appears most successful is some saline aperient which produces a "weeping" from the mucous surface of the intestines, and hurries on the contents. This clinical fact suggests that the cause of eczema lies in some imperfect process of digestion, whereby some abnormal chemical compounds are absorbed, and, circulating in the blood, irritate especially the skin structures. These compounds are, Dr. Pearse admits, unknown. Not only, however, are saline aperients successful in the treatment of eczema, but alkaline combinations especially so. The most common prescriptions contain these drugs in endless variety. This treatment is very successful for adult life, but it is not nearly so useful in the eczemas of young children. In these cases, however, alkaline applications are equally successful in those of riper years, if not more so. Whether the fault in adult life lies in deficiency and that of eczematous children in excess of secretion of acid gastric juice is difficult to decide, but the internal administration of alkalies combined with saline aperients in the eczemas of grown-up people is that on which the greatest reliance is generally placed. In children, however, an exactly opposite line of treatment will often be found successful. It is especially in scrofulous children and in the general eczema of infants that he has found benefit from the administration of hydrochloric acid. These little patients have generally some palpable digestive disturbance. He has frequently found unexpected benefit from the internal administration of nitro-hydrochloric acid combined with sulphurous acid, and at the same time the external application of alkalies. These latter may be used as bicarbonate of sodium solutions, five to ten grains to the ounce, sometimes combined with small quantities of glycerin, or by weak solutions of liquor potassæ, ten to thirty drops to the ounce. As a general rule, it may be said that the more acute the eczema, or rather the more copious the exudation, the weaker must be the application. It should be applied, whenever possible, continuously. In chronic cases ointments may sometimes be used, such as bicarbonate of sodium, ten to thirty grains to the ounce of vaseline.

THE INFLUENCE OF CONDURANGO ON THE SECRETION OF THE DIGESTIVE JUICES.

TCHELZEW has experimented in Botkine's laboratory as to the influence of condurango on the secretion of the gastric, pancreatic, and biliary secretions, the experiments being made on dogs in whom fistulæ had been made, each animal being allowed to fast for eighteen to twenty hours before being subject to experiment. The condurango was administered in the form of a decoction of 15 parts of the root to 360 parts of water, and then evaporated down to 180 parts. The author obtained the following results (*Bulletin Général de Thérapeutique*, July 15, 1888):

First.—If the dog has not fasted, condurango produces no appreciable effect.

Second.—On the contrary, when the dogs have fasted from eighteen to twenty-four hours, condurango produces a very appreciable increase in the amount of gastric juice and pancreatic juice secreted.

Third.—Condurango also acts on the biliary secretion, but to a less degree than on the pancreatic juice. The increase of the secretion of bile sometimes concerning the amount of water alone; at other times the solids. The effect, according to the author, is more marked on the pancreatic juice than on the gastric secretion.

THE TREATMENT OF MIGRAINE WITH INDIAN HEMP.

In the *Practitioner* for July, 1888, MR. RICHARD GREENE relates notes of three cases of migraine of severe character in which a most marked improvement followed the use of cannabis indica. Of course the small number of cases related might indicate that the result was here merely a coincidence, but the author claims that he feels confident that recovery will more frequently follow cannabis indica in migraine than the use of bromides in epilepsy; while, further, the treatment is not merely a palliative one during the paroxysm, but is often curative, and nearly always gives some lasting relief. The alcoholic abstract appears to be the best form of the drug to prescribe, and nothing but the freshly-made preparation, according to Mr. Greene, can be relied on. ⅓ of a grain made into a pill and taken every night, or every night and morning, is generally sufficient to begin with, and in severe cases the dose may be quickly raised to ½ a grain or ⅔. The writer states that he has never seen unpleas-

ant symptoms follow this course except in the case of a patient who took a double dose before breakfast, and in whom slight, but not alarming, toxic effects were produced. He seems certain that more than 1 grain should never be given, except to patients habituated to its use.

THE TREATMENT OF INVETERATE ULCER OF THE LEG.

Dr. Appenrodt, of Clausthal, claims attention for a new mode of treatment of chronic ulcer of the leg. Every one who has to treat many such cases is aware of the occasional extreme difficulty in obtaining a cure, under even the best methods. Generally speaking, one is inclined to imagine that the most obstinate ulcer must heal if kept aseptic, if congestion is relieved, and if the borders or floor are more or less destroyed or "revitalized" when necessary. But still many cases remain intractable, and linger on, an opprobrium to medical art. Confinement to bed is often impracticable, and its effects are always only temporary, while india-rubber bandages and adhesive plasters prevent perspiration and set up eczema. Incisions are useless until the circulatory conditions of the ulcer and its vicinity are readjusted and the lymphatic stasis overcome. In a number of cases which had resisted all ordinary treatment, Dr. Appenrodt obtained success, after much trouble, by the persistent use of massage, and does not hesitate to recommend this method most strongly. Before beginning, the leg should be carefully cleansed and disinfected, then light *effleurage* is made below the knee, reaching gradually downward; only light pressure should be used; the appearance of lymph-exudation about the ulcer is the first sign of its good effects. The best material to employ in massage is lanolin (Jaffé and Darmstaedter), because, owing to its tenacity, it does not irritate, but protects, the skin. After massage the skin is again well washed with soap and water, and disinfected; the ulcer and any excoriations are dressed with lanolin on lint; over this is placed a sheet of silk, and a cambric bandage is applied over all. The addition of disinfecting substances to the lanolin is not necessary, as they usually irritate the skin, and impermeable coverings must be altogether avoided. Under this simple treatment the swelling soon subsides, desquamation ceases on eczematous places, and granulations rapidly spring up on the ulcer itself. It is but rarely advisable to apply zinc oxide and starch to the former, or nitrate of silver to the latter. In spite of the abundant granulations, it takes a long time before the ulcer is healed, owing to the callosity and immobility of the skin, and in suitable cases Reverdin's transplantations may shorten the process. The massage must be continued for a good while after a cure has been effected, in order to restore as far as possible the natural condition and prevent relapses. The patient should make free use of the limb during the treatment, for it will be found that the pain and tendency to œdema soon cease.—*The British Medical Journal*, July 28, 1888.

MODELLING CLAY IN MASTITIS.

Dr. E. L. Maïzel mentions in the *Vrach* (No. 21) that he has for some time employed modelling clay as an application in mastitis, with excellent results. The idea was obtained from Dr. S. Lukashevich, who employed white modelling clay in epididymitis. Dr. Maïzel has made use of it in twelve cases,—seven of parenchymatous inflammation, of which only three suppurated; and five of phlegmonous inflammation, of which only one went on to form an abscess. The pain was rapidly alleviated and the fever diminished by this treatment, which, if commenced sufficiently early, appeared to cause the inflammatory process to terminate in resolution without the formation of pus. When abscesses had formed and broken, the wound rapidly healed, and the indurated lobules returned to their normal condition without suppurating, the clay proving a much less troublesome treatment than Kiwisch's plan of starched bandages, and much less painful than the application of collodion, as recommended by Latour and Sprengel, being at the same time quite as satisfactory in its results. This method is especially suitable for country practice, as white modelling clay is a very common and cheap substance, and patients take to the treatment very kindly, the application being always grateful to them. The capacity for heat possessed by clay being considerable, it answers the purpose of ice-bags or cold compresses, and is greatly preferred to them by patients. The method of application is simple enough. The breast is first washed with a sponge and a piece of soft gauze applied to it. Another piece of gauze is then cut to the proper size, an aperture being made for the nipple, and an even layer of well-mixed clay, free from lumps, spread

over it. This is then applied to the breast over the first piece of gauze, and secured by a bandage passing over the shoulder of the opposite side. The dressing is renewed night and morning. This kind of treatment is also applicable in distressing fulness of the breasts, when for any reason the patient cannot suckle the child. The secretion is arrested, and the fulness and tenderness often disappear in the course of twenty-four hours.—*Lancet*, June 23, 1888.

METHODS OF REMOVING NASAL POLYPI.

At the meeting of the Edinburgh Medical Chirurgical Society, held on July 4, 1888, Dr. McBride read a paper "On the Methods of removing Nasal Polypi" (*Medical Press*, July 11, 1888). He deprecated the use of forceps—especially without illumination of the nostrils—in this operation, as being unscientific, and giving more pain to patients than when a snare is used. He had, after giving it a fair trial, found the electric cautery as a snare and cauterizer of roots unsatisfactory. It certainly lessened bleeding, but this was a convenience, and nothing more. He had also found the electric cautery more painful to the patient than the cold snare. In cases of sessile growths and fringes of small polypi the electric snare was useful. But in cases of ordinary pedunculated polypi he preferred the cold wire snare, and then not for abscission but for evulsion. If the tumor is cut away, a piece of diseased tissue may be left behind, but if pulled off, it comes away at its point of attachment, and thus is more fully removed. To avoid recurrence, a spray of rectified spirit, as first recommended by Mr. A. G. Miller, may be used, but in some patients its use sets up unpleasant irritation. As a rule, he destroyed the stump either by means of the galvano-caustic burner, or with chromic acid fused on the end of a probe. To allay the pain of this operation he used cocaine, or menthol and cocaine, twenty per cent. of each in olive oil. In the case of post-nasal polypi, polypi projecting into the naso-pharynx and resting on the palate, which are usually single and growing from the edge of the choanæ, the snare may sometimes be used from in front, guided by the forefinger of the left hand in the pharynx; in other cases the snare must be applied from the pharynx, and when thus applied the advantage of evulsion of the tumor is apparent. These tumors seldom recur.

Mr. Duncan thought Dr. McBride had been too severe on the use of the forceps. He did not think the difference between snare and forceps of much moment. Probably he preferred the forceps because he could take away more polypi with it, and the operation took less time. The amount of pain given was really a question of delicacy of manipulation. He also found he could remove naso-pharyngeal polypi more easily with the forceps than the snare; with the finger in the pharynx the forceps could be properly guided to the spot. Of the solitary polypi to which reference had been made, he had met with three or four examples. They usually occurred in young people, they projected posteriorly, were somewhat firmer than ordinary mucous polypi, pedunculated, and easily separated. They differed greatly from the fibrous polypi which grew from bone, and appeared to be analogous to pedunculated fibrous polypus of the rectum.

Dr. McBride, replying, said he did not altogether condemn the forceps, but rather the blind use of it, which was so common, and which he did not think Mr. Duncan would defend. As to the question of pain, he drew his conclusions from the statements of intelligent patients, who said the snare was less painful than the forceps. For impatient patients the forceps was certainly quicker, but he doubted if it were better for them, as usually no attempt was made to prevent recurrence of the polypi. He was inclined to look upon the solitary polypi as midway in structure between ordinary mucous and fibrous growths.

IODIDE OF POTASSIUM IN CARDIAC DYSPNŒA.

M. Sée (*Journal de Médecine et de Chirurgie*, July, 1888) has for a long time employed iodide of potassium not only in asthmatic dyspnœa but in dyspnœa of cardiac origin, and he considers it as an excellent cardiac remedy, whose only disadvantage is that it is not diuretic, a defect, however, which may be remedied by adding to it the use of milk. Iodide of potassium acts evidently on the respiratory mucous membrane and on the nervous apparatus of the respiratory system. In case of a valvular lesion its effects are less marked than when there is a lesion in the cardiac tissue itself. Nevertheless, it generally suffices to cause the disappearance for a time at least of the dyspnœic element. Before, however, pronouncing the existence of asthmatic or cardiac dyspnœa, the following fact

must be noticed. In a large number of asthmatic individuals a very slight but evident systolic murmur may be heard at the base, or, more rarely, at the apex, and may occasion the dread of a valvular lesion. This murmur, which appears to reside in the valves of the right heart, will disappear entirely in a few days under the use of iodide of potassium. The dose, which is to be employed daily, is about 20 grains, which may be gradually increased to 30 or 45 grains. The inconveniences of the prolonged action of iodide consists in the production of congestion of the respiratory passages, and in tuberculosis may even lead to a hemorrhage. It should, therefore, be given very carefully where tuberculosis is suspected. Iodide of sodium is much less stable than the iodide of potassium, and contains less iodine. Dr. Sée also calls attention to the fact that in many cases troubles which have been attributed to the use of iodide of potassium are occasionally due to the fact that iodide of potassium is often contaminated with iodates, which are extremely poisonous.

THE SURGICAL TREATMENT OF ABSCESS OF THE LUNG AND EMPYEMA.

At the meeting of the Surgical Section of the British Medical Association, held in Glasgow on August 7, 8, 9, 10, and 11, MR. T. PRIDGIN TEALE (Leeds) opened a discussion on "The Surgical Treatment of Abscess of the Lung and Empyema" (*Lancet*, August 11, 1888). He detailed four cases under his own care of abscess of the lung opening into the pleura. Two of these were cured by free incision and drainage; the others died. He also reported two successful cases under the care of Mr. Hartley (Leeds) and Dr. Davies (Swainton). Mr. Teale concluded: 1. That we are losing our fear of exposing the pleura. 2. The evil of admission of air into the pleural cavity is not the mere exposure of the pleural surface to the air, is not that the lung collapses by the mere admission of air, but is that, where there is a fairly healthy lung and pleura, the inrush of air reduces seriously the mechanical power of the thoracic wall over respiration. 3. That in such cases some method of closing the wound to the entrance of air, while allowing adequate drainage, must be adopted. 4. That the region of the diaphragm is a situation in which abscesses amenable to surgical treatment frequently occur. 5. Such abscesses can be most safely attacked through the lower angle of the thorax, provided there be dulness at the seat of puncture. 6. As to washing out the cavity of a large pleural, pulmonary, or hepatic abscess cavity, it is probable that antiseptic washing is of value in the early period while the fluid is offensive, but afterwards it tends to disturb the comfort of the patients, and is unnecessary if drainage is effective. 7. As regards excision of a portion of rib, Mr. Teale had no personal experience, but thought it should be reserved for special and exceptional cases.

SIR SPENCER WELLS reported the case of a patient admitted under his care in 1843 to Malta Hospital, apparently dying of phthisis. An abscess had formed in the right axilla. This was opened, and air and pus escaped; it continued open for a long time, but the patient recovered, and is still, after forty years, alive and well. In reporting this case forty years ago, Sir Spencer Wells advocated the incision of the lung in cases of abscess. He still supported this view, and looked hopefully on the operations of incision or removal of parts of the lung in gangrene, and on removal of parts of the ribs in exceptional cases.

MR. JESSOP (Leeds) stated that the dangers of opening the pleural cavity were more imaginary than real. On two occasions he had opened the pleural cavity accidentally; air entered freely, and the lung maintained its position, size, and shape without sign of collapse. Both cases did well.

DR. WARD COUSINS (Portsmouth) referred to the difficulties of re-expansion of the lung and closure of the cavity of the pleura in cases of empyema. He advocated free and early incision, with drainage. This was especially successful in cases of young children. In adults he did not use drainage-tubes after the first few weeks, and he kept the incision open by dilating it when necessary with india-rubber bags. He also recommended the excision of a portion of the rib in cases of empyema with pulmonary fistulæ and discharge.

DR. JOHN DUNCAN (Edinburgh) thought thoracic abscess should be treated like all other abscesses, by opening and drainage. Treatment will vary according to class of case. In children simple opening and drainage will suffice. In adults, in early cases, drainage only is necessary; in medium cases, suction is an advantage, and Dr. Duncan showed an apparatus for the purpose; in old cases where death must occur from amyloid disease, excision of a portion of the rib is required. Dr. Duncan reported four successful cases from this operation.

MR. WINKFIELD (Oxford) reported a suc-

cessful case of empyema, in which a portion of rib was removed, and a lost drainage-tube recovered from the pleural cavity.

DR. WEBB (Wirksworth) advocated free incisions, frequent washing, and adequate drainage as the result of a large experience.

MR. JORDAN LLOYD (Birmingham) referred to two cases in which separate punctures made at the same time yielded serum and fetid pus. These cases were supposed to be interlobular empyemata rather than intra-pulmonary abscesses. He advocated freedom of drainage, and thought that could often be obtained by increasing the length of an incision rather than by increasing the breadth of a tube.

DR. WARDROP GRIFFITH (Leeds) deprecated the habit of excision of a portion of a rib as part of a primary operation, and maintained that satisfactory drainage was obtained in the great majority of cases by simple incision and insertion of a tube. He afterwards discussed the manner of re-expansion of the lung after operation.

THE EXTERNAL APPLICATION OF SULPHUR IN SCIATIC NEURALGIA.

In the GAZETTE for April, 1888, was published an article on the external application of sulphur in sciatic neuralgia. In confirmation of the results there referred to we call attention to the report of a case by DR. J. D. COWDEN, in the *Peoria Medical Monthly* for July, 1888. The case was that of a young man, aged 45, suffering from severe sciatica, in whom the usual remedies for neuralgia had been tried, with indifferent results, until finally, in addition to the usual treatment, a ½ grain of morphine and $\frac{1}{60}$ grain of atropine had to be injected hypodermically twice or three times in twenty-four hours to give him even temporary relief. Dr. Cowden then tested the result of enveloping the limb in dry sulphur, ceasing the hypodermic administration of morphine. In less than two hours he was sweating profusely, sleeping soundly, and oblivious to all pain and suffering. He woke up in the evening long enough to take some nourishment, and then fell asleep, and slept continuously during the following night, the perspiration continuing, and awoke in the morning free from pain, and able to turn over in bed and move and extend the limb in all directions without complaint. The look of suffering that had been so marked before the application of the sulphur was gone. He then got up and, to his great surprise, walked easily about the room without suffering or pain. He was then put into a large wash-tub, thoroughly scrubbed and washed with soap and water, after which, at his own request, he was again put to bed and the sulphur reapplied to the limb and sacral region of the spine. The next morning he was given another bath; the neuralgia had disappeared, and from that time on, without further medication, his recovery was continuous, and, so far as the pain is concerned, up to this writing is complete.

For a few days after discontinuing the sulphur he suffered from sleeplessness and nervous prostration, but the further progress of the case towards recovery was left to the *vis medicatrix naturæ*.

The perspiration, the breath, and urine, after the application of the sulphur, were very soon impregnated with sulphuretted hydrogen, making it very disagreeable for the patient and his attendants on that account. The rapid absorption of sulphur, as shown by the profuse perspiration, perfumed breath, etc., and the speedy relief which followed its application, would seem to point to a specific action of the remedy.

On April 30, some two weeks after the above report was written, the patient had a relapse, caused by sleeping in a draft between two open windows, and the sulphur had to be reapplied. The same happy effect, entire relief from pain, followed as quickly and promptly as it did on the first application of the remedy.

THE TREATMENT OF DYSPEPSIA.

Inasmuch as dyspepsia is the commonest ailment met with in practice, the treatment should be based upon definite principles, and empiricism as far as possible avoided. The objective symptoms presented by the tongue are of great diagnostic value. Subjective ones, such as sour eructations, are not always to be relied upon, and frequently they are not at all well defined. In the determination of the acute cause of dyspeptic symptoms, the question is not so much one of glands and their secretion, as of mucous membranes and their blood-supply. Every one is familiar with the appearance of the foully-furred tongue of acute indigestion, from the irritation of indigestible and offensive food stuffs; and with the rapid cleansing effect upon it of full doses of Epsom salts. It may be taken for granted, that when the tongue is furred

or coated ever so little, there is congestion to a greater or less extent of the gastric mucous membrane. The coating is due to multiplication of epithelium, which would appear to be a natural consequence of passive congestion. The same effect is observed in psoriasis and seborrhœa, in less vascular tissues.

The indication in treatment, therefore, is to relieve congestion. According to DR. C. R. ILLINGWORTH (*Med. Press*, August 8, 1888), this may be effected, firstly and chiefly, by drugs which have an exosmotic action, such as the sulphate and carbonate of magnesium; the sulphate, tartrate, and carbonate of sodium; aloes, rhubarb, etc.; and, secondly, by those which have an endosmotic action, and thus diffuse the stagnating fluid through the blood-vessels. Of these, the carbonates of ammonium, sodium, and potassium are the most important. Others are the nitrates and iodides of potassium and sodium. By thus unloading and flushing the blood-vessels of the intestinal tract, the mucous membrane is generally restored to a healthy condition, which is at once indicated by a more or less clean tongue. When much pain is complained of, from 2- to 3-minim doses of morphine solution or chlorodyne may, at the same time, be prescribed. But, when the dyspepsia has existed for some little time before advice is sought, further measures are needed in addition. The intestinal circulation requires stimulating by *carminatives*, such as cardamoms, ginger, and capsicum. Still more powerful and direct stimulants are found in those drugs which act upon the muscular and nervous tissues of the blood-vessels, such as belladonna and nux vomica, the former exerting a stimulant action upon the walls of the blood-vessels through the sympathetic, and the latter through the cerebro-spinal nervous system.

The following is a useful formula:

℞ Ammon. carb., ℥ss to ℥i;
Magnes. sulphat., ℥iii to ℥vi;
Tinct. belladon., ℥i;
Tinct. nucis vom., ℥i;
Tinct. zingib., ℥ii;
Sp. etheris chlorici, ℥ii;
Aq. menth. pip., ad ℨvi. M.
Ft. mist.
Capiat æger semiunciam quartis horis.

When the tongue, by its clean appearance, indicates that equilibrium has once more been restored to the circulation in the alimentary tract, there frequently remains a debility or want of tone in the digestive system, shown by a flabby or loose and pallid state of the epithelium of the organ, coupled with symptoms of anorexia and flatulence. Acids and nux vomica are then of great service, given after meals. Acids are also very useful in the treatment of dyspepsia occurring in elderly and delicate people, whose only complaint is that food "lies like lead" upon the stomach. The tongue in such cases is, as a rule, perfectly clean.

Flatulent colic is an affection of very frequent occurrence, in women particularly. There is not in the first instance any affection of the mucous membrane, for the tongue is generally quite clean, becoming foul only when the colic persists. The mischief would appear to be due to stasis or congestion in the larger venous trunks, comparable to that which occurs in the respiratory tract in asthma. It is generally caused by cold or exhaustion, and it is always accompanied by collapse. In some cases the gall-bladder is sympathetically affected, as indicated by pain under the edge of the right ribs anteriorly, shooting through the chest to the right shoulder-blade. In cases of this nature the indications are the employment of endosmotics, such as the carbonates of ammonium and sodium, for the purpose of obviating the stasis of venous blood, and thus relieving the intense pain caused by the tension of the blood-vessels, and the giving of cardiac stimulants, such as brandy and belladonna, to restore the peripheral circulation, and thus prevent collapse. Thus,—

℞ Sp. ammon. co.,
Liq. ammon. acetat., āā ℥iii;
Ether chlor., ℥ii;
Tinct. zingib., ℥ii;
Tinct. belladon., ℥i;
Aq. menth. pip., ad ℨvi. M.
Ft. mist.
Sig.—℥i omni quadrante horæ vel pro re natâ.

Antipyrin and kindred preparations frequently act with great rapidity in such cases as endosmotics, relieving patients thus affected as if by magic; but it is well to keep up their effect with a mixture containing belladonna and ammonia. Local application of heat is also an excellent means of treatment. Morphine relieves the pain but increases the danger of collapse by its depressant action upon the circulation. Hence it should be avoided. In some aggravated cases the mucous membrane is affected, as indicated by foully-furred tongue and constipation. In these, full doses of the sulphate or carbonate of magnesium should be added to the ammonia and belladonna, and also some carminative, such as ginger or cardamoms; while in those cases where there are indications that the gall-bladder is affected

with the spasm, a calomel and opium pill will generally suffice to effect a rapid cure. The irritation set up by "flatulent colic" not infrequently affects the arterial capillary system, leading to *stasis* of the blood and sympathetic inflammatory mischief. The diagnostic value of tongue symptoms is here again apparent. The organ presents a dry, hard surface, indicative of the effusion of inflammatory lymph between the mucous and submucous tissues of the affected portion of the intestinal tract. In such cases endosmotic remedies, such as ammonia and liquor ammoniæ acetatis, are alone indicated, to give flowing power to the stagnant blood. With such treatment the pain is soon relieved, and the tongue quickly resumes a moist appearance.

THE TREATMENT OF SLEEPLESSNESS.

Recipes for sleeplessness continue to present themselves. A correspondent of the *Lancet*, August 11, 1888, has found the following to be an effectual remedy in his own case: After taking a deep inspiration he holds his breath till discomfort is felt, then repeats the process a second and a third time. As a rule, this is enough to procure sleep. A slight degree of asphyxia is thus relied on as a soporific agent, but the theoretical correctness of this method is somewhat open to question. Certainly there is proof to show that the daily expenditure of oxygen is most active during the waking period, and that nightly sleep appears to coincide with a period of deficient tissue oxygenation. It is at least as probable, however, that other influences are associated with the production and timely recurrence of sleep besides that just referred to. This plan, moreover, however effectual and beneficial in the case of its author, is not without its disadvantages. The tendency of deficient oxygenation is to increase blood-pressure and to slow the heart's action. With a normal organ, as an occasional occurrence this might not be of much consequence. If, however, the impeded heart should also be enfeebled by disease, the experiment might be repeated once too often. Another combatant in the struggle with insomnia lays down a series of rules, for the most part very sensible, to which he pins his faith. Considering that the chief cause of sleeplessness are mental worry and the want of a due amount of exercise and fresh air, he advises his fellow-sufferers to observe the ordinary rules of hygiene relating to such matters, to take food and drink in moderation, and to avoid of an evening the use of tea, coffee, and tobacco. In dealing with severe nervous irritation from mental or physical work, he has found a daily rest an almost essential prelude to sleep at night. Thus, he treats of sleeplessness rather as a tendency requiring constitutional remedies than a symptom of mere brain excitation. There is much to be said for his theory and means of treatment.

HYDRASTIS CANADENSIS AND VIBURNUM PRUNIFOLII.

In the *Internationale Klinische Rundschau*, No. 26, 1888, PROFESSOR SCHATZ speaks in the highest terms of the use of *Hydrastis canadensis* in controlling hyperæmia and conditions of chronic inflammation of the internal genitals. He explains the occasional failure which has followed its employment by German physicians from the fact that the preparation that they have used was not manufactured from the fresh plant. The latter preparations, he claims, are perfectly astonishing in the marked results there produced. In uterine myomata the menstrual hemorrhages are reduced and regulated, but he states he has even seen a case where the myoma extended to the umbilicus, after the regular use of about three pounds of the fluid extract, in two years almost entirely disappeared. He further confirms his early statement that hydrastis does not produce uterine contractions, but only leads to reduction in the calibre of the blood-vessels.

In *Viburnum prunifolii* Dr. Schatz thinks that we have found a remedy possessed of attributes different from that of any other drug. The action of this substance, according to the author, is to reduce and even suppress the uterine contractions which are so apt to occur in women who have previously aborted and seriously endanger the duration of pregnancy. This remedy likewise must be used regularly and for months long in doses of from 45 to 60 grains of the solid extract. This remedy cannot be replaced either by opiates, on account of their disadvantages, or by potassium bromide, which, in corresponding large and regular doses, produces great drowsiness. On the other hand, the opiates cannot be entirely replaced by viburnum, especially where the uterine contractions are intense and from their severity call for their rapid suppression. In labor, terminating normal pregnancies, viburnum is

too slow in its action to have much therapeutic application.

As to the way in which this remedy acts, the author rather inclines to think that it owes its action to irritation of the inhibitory centres of the uterus than to depression of the uterine motor centres.

CHLOROFORM-WATER AS A SOLVENT FOR DRUGS.

DR. UNNA (*Therapeutische Monatshefte*, July, 1888) has employed the antiputrefactive power of chloroform-water for the preservation of solutions of drugs for subcutaneous employment. When a solution of chloroform-water is injected under the skin a slight burning sensation is produced; but general action, attributable to chloroform, is but rarely produced. In many cases, however, no objective sensation follows the injection of chloroform-water in the gluteal muscles. Unna recommends the substitution of chloroform-water for distilled water in the preparation of Fowler's solution, and all ergotin preparations, even when intended for internal use. He likewise recommends the addition of a few drops of chloroform to morphine solutions, and in fact he finds it preferable to dissolve all alkaloids, whether intended for internal or external use, in solutions of chloroform-water.

THE INFLUENCE OF SALTS OF RUBIDIUM AND CÆSIUM ON THE HEART.

SERGE BOTKINE, the son of Professor Botkine, publishes his inaugural thesis on the action of the salts of rubidium and cæsium on the heart, a paper which possesses peculiar interest from the classification which it attempts of remedies according to their chemical analogies. According to the classification of Mendelejeff, potassium, lithium, rubidium, and cæsium belong to the same chemical group, and if there is any relationship between the physiological and chemical effects of the elements, the salts of this group should act in the same manner on the heart. This analogy of action is apparently proved by Botkine in a series of physiological and clinical experiments, of which the following is a summary (*Bulletin Général de Thérapeutique*, July 15, 1888):

1. The chlorates of rubidium and cæsium increase the blood-pressure and slow the cardiac pulsations.

2. This slowing depends principally on an irritation of the pneumogastric centre, while the peripheral inhibitory apparatus of the heart is likewise subject to the influence of the salts of rubidium and cæsium.

3. The increase of blood-pressure may be principally attributed to an action on the heart and blood-vessels.

4. The difference between the action of salts and those of potassium is purely qualitative. The salts of rubidium act more energetically than those of cæsium, and, as a consequence, they approach more nearly in their action the salts of potassium. These salts were administered in ten cases of compensatory troubles of the heart. Their action was feeble, especially in inveterate cases, but manifested itself by an improvement in the pulse and general condition. No disagreeable effects were produced. 5 grains of an aqueous solution of the chlorate of rubidium were given five times daily.

THE TREATMENT OF REBELLIOUS ULCERS BY MULTIPLE INCISIONS.

As is well known, the difficulty in healing a rebellious ulcer by cicatrization too often fatigues the patience of both the surgeon and subject. SPAETH has recently proposed a treatment which he pronounces to be a radical cure, although it is not a purely novel one. The principal difficulty in the cure of chronic ulcers is found in the anatomical structure of their borders, where nutrition is depressed and the circulation insufficient, and, as a consequence, the tissues at these points contain few vessels, possess a fibrous texture, and show no tendency to granulation. Among the classical surgical procedures the lateral incisions of Weber and the circular incisions of Nussbaum are little efficacious, and on such surfaces transplantation of skin is about the only method which holds out any hope of success. In such cases Spaeth and Harbordt (*Revue Générale de Clinique et de Thérapeutique*, July 19, 1888) divide the ulcer by a longitudinal incision, penetrating into the healthy tissue, then making other incisions perpendicular to the first and of the same depth, dividing the borders of the ulcer at intervals of about three-quarters of an inch. Hemorrhage may be controlled by tampons, and the wound dressed with iodoform. Eight or ten days later granulations will be found springing from the incisions which have now become covered by new epidermis, and, if needful, transplantation of skin may

now be practised with success. It is claimed that this treatment produces cicatrices more resisting than those resulting from other procedures.

ANTIPYRIN, ACETANILIDE, AND SOLANINE.

Dr. G. Sarda publishes an elaborate article in the *Bulletin Général de Thérapeutique* for May 30, 1888, as to the action of these drugs, reaching the following conclusions:

Antipyrin, acetanilide, and solanine have all a powerful action on the nervous system. Antipyrin is more efficacious than the other two in the treatment of articular rheumatism, migraine, and recent neuralgia.

Antipyrin and acetanilide have about the same action in articular rheumatism and in the pains of tabes. Acetanilide is to be preferred to antipyrin in chronic neuralgia cases and where it is to be employed in the motor excitation. Solanine is likewise a valuable remedy for the suppression of pain, although it is less active in acute articular rheumatism than the other two remedies. It seems to be more efficacious in cases of chronic neuralgia, especially when complicated with neuritis, while it likewise modifies the pains of tabes; it is especially suited for the reduction of motor irritability. Employed in doses of from ⅓ to ½ grain daily, it arrests the tremor in spinal sclerosis, although, as a rule, it possesses little action when the sensory or motor system is depending upon an anatomical lesion.

COMBINED CHLOROFORM AND COCAINE ANÆSTHESIA.

Professor Obalinski, of Cracow, remarking the antagonism between chloroform and cocaine, determined to take advantage of it in anæsthesia for operative purposes, and has now employed the combined chloroform and cocaine method in twenty-four cases with, as he states, the most satisfactory results. He first administers chloroform by means of an Esmarch's mask until the stage of tolerance is reached, which is generally in from four to twelve minutes, with the use of from 1 to 3 drachms of chloroform. He then injects into the region about to be operated on a solution of cocaine of the strength of from three to five per cent., the total quantity of cocaine injected being from three- to five-sevenths of a grain. Even more than this might, he thinks, be safely used, both because chloroform is the best antidote to cocaine and because part of the cocaine is about to be removed from the body by the operation. After the injection no more chloroform is, as a rule, given, unless in protracted operations, when very small quantities are administered at considerable intervals. For this method several advantages are claimed, among others the following: A smaller quantity of chloroform is sufficient; vomiting is very rare; the depression on awaking is much slighter than when chloroform only is used. The only disagreeable symptoms which Professor Obalinski has observed have been excitement and throwing about of the arms in some nervous people, but as this occurs when chloroform alone is used, it is not at all certain that it ought to be ascribed to the cocaine. He recommends the combined method for extensive operations, finding the local use of cocaine usually quite sufficient to render minor operations painless.—*Lancet*, August 4, 1888.

CHLORIDE OF METHYL SPRAY IN THE TREATMENT OF CHOREA.

At the meeting of the Société de Thérapeutique held June 27, 1888, M. Huchard, referring to the fact that Lubinski had obtained good results from ether spray applied to the vertebral column in the treatment of chorea, recommended the employment of the spray of the chloride of methyl in the same manner in similar affections. He referred to one case in which an extremely favorable result was obtained,—a case of rhythmical hysterical chorea,—although he considered that in the estimation of the value of this treatment the hysterical element in the case deserved consideration. He also stated that he had obtained good results from this method of treatment in cases of spinal irritability, and he thought that perhaps this therapeutic procedure might be applicable to other spinal neuroses, exophthalmic goitre in particular.—*Le Progrès Médical*, June 28, 1888.

ACETANILIDE IN CONFLUENT SMALLPOX.

Dr. Hermann Haas recommends the employment of acetanilide in confluent and hemorrhagic smallpox for the following reasons (*Deutsche Medizinal-Zeitung*, July 5, 1888):

1. In relatively small doses it produces great reduction in the exacerbation of the fever.

2. It, as a consequence, greatly lightens the symptoms depending upon the severity of the fever.

3. It acts as a tonic to the nervous system, reducing the chills, which are so often a serious complication, and leads to the production of sleep.

4. It appears, by the constant reduction of fever which it produces, to influence the tissue-waste, and so render the organism better able to withstand a prolonged elevation of temperature.

5. It effects the digestive tract in no manner, so that the appetite rapidly returns in convalescence, and the diarrhœa which often will follow other methods of reductions of temperature may readily be controlled by opiates.

CAPSELLA BURSAPASTORES AS A STYPTIC.

The herb commonly known as Shepherd's Purse (*Capsella bursapastores*) has lately been recommended as a styptic remedy. It has been examined by E. Bombelon. From his chemical investigation it appears that the plant contains an alkaloid, to which he has given the name of bursine; a tannin which precipitates iron salts green; and an acid named bursinic, which he regards as the active principle of the plant. It is obtained by precipitation of the fluid extract with acetate of lead. The bursinate of lead is decomposed with sulphuretted hydrogen and the solution of bursine, filtered and evaporated, and the residuum dried over sulphuric acid. It forms a pale-yellow astringent and pungent mass, which reduces Fehling's solution when boiled with it. The alkaloid from its character appears to resemble sulphocyanide of sinapine. Bombelon recommends for use in medicine a fluid extract of the plant, in doses of 1 or 2 teaspoonfuls, to stop hemorrhage, as a substitute for ergot. It may be remarked that it has long been used as a domestic remedy for hemorrhage; indeed, this property of the plant is indicated in Linnæus's "Materia Medica," published in 1749.—*The Provincial Med. Journal*, July 2, 1888.

PHARYNGEAL CONGESTION OF UTERINE ORIGIN.

M. Cheron calls attention to the fact that in certain cases of endometritis there is produced intense congestion of the pharyngeal mucous membrane, accompanied by sensations of constriction and heat, with difficulty in swallowing, and a slight dry, incessant cough,—these pharyngeal troubles being accented during the menstrual period. The treatment of this complication is not as simple as might be supposed. Most of the remedies usually employed in pharyngitis, the astringents in particular, augment the congestive troubles. Cocaine, which temporarily arrests the cough and the sensation of constriction, is soon followed by a paralytic congestion of the vessels in the pharyngeal walls. Gargles of warm water containing resorcin and glycerin are free from this inconvenience, and usually produce good effects, especially when accompanied by the use of fractional doses of belladonna.—*Revue Générale de Clinique et de Thérapeutique*, July 12, 1888.

A MEANS OF REDUCING THE PAIN IN SUBCUTANEOUS INJECTIONS OF ANTIPYRIN.

One of the principal drawbacks to the subcutaneous use of antipyrin is the pain which it produces. The combination of ergot with antipyrin has been tried over and over again, but with the result of an only partial relief of the pain. Dr. Derlon (*Revue Générale de Clinique et de Thérapeutique*, July 12, 1888) states that this difficulty may be avoided by employing cherry-laurel water as a vehicle containing cocaine and the antipyrin in solution in this. The strange part of this claim is that cherry-laurel water combined with solutions of morphine renders hypodermic injections of the latter more painful.

TANNIN IN DILATATION OF THE STOMACH.

According to the Paris correspondent of the *British Medical Journal* (July 21, 1888), Dr. H. Boulland, thinking that tannin—which acts on the retractibility of the mucous membrane, and is at the same time absorbent and antiseptic—might be useful in dilatation of the stomach, has employed it in many cases with success. In cases where constipation was present, Dr. Boulland administered doses of 10 centigrammes (1½ grs.) instead of 20 centigrammes (3 grs.) By this means the regularity of the bowels was not interfered with, and the dilatation decreased in proportions analogous to those obtained by washing out the stomach. In twenty days the stomach was reduced nearly to its normal condition.

At the same time the patients took frequent but light meals, chiefly of pasty substances, and no starchy matter. When the dilatation is due to a tumor, tannin does not give better results than other methods. It diminishes mucous secretion, however, and renders the digestion less painful. Dr. Boulland has found the hæmostatic properties of tannin equal to those of ergotin and perchloride of iron. In particular, he has used it with success in many cases of epistaxis when all other means had failed.

THE PURGATIVE ACTION OF GLYCERIN ENEMATA.

Dr. Subbotic confirms the testimony which has rapidly accumulated as to the efficaciousness of a rectal injection of glycerin in producing evacuation of the bowels. He offers an explanation, however, of the occasional failure which follows its employment from the fact that it produces no result when injected into an entirely empty rectum. When, however, masses of fæces occupy the rectum the glycerin injection is invariably promptly active. The injection acts through an increased secretion of fluid and a consequent irritation of the intestine. This irritation, however, appears only to be sufficient to empty the lower parts of the intestine, while it is insufficient when the rectum is empty to cause the downward passage of the contents of the upper bowels.—*Centralblatt für Gynäkologie*, No. 27, July 7, 1888.

THE PHYSIOLOGICAL ACTION OF SENECIO CANICIDA.

The plant *Senecio canicida*, a member of the family of the Composita, is, as its name indicates, employed by the Mexicans for killing dogs, and is further a constituent of various household remedies for producing perspiration and in the treatment of various cutaneous affections. The first studies of this plant were made by Gouiltouet, who found that this poisonous principle was active not only on dogs but on all other animals, and was contained in small amount in the leaves and in more abundance in the roots. The toxic symptoms are divided into three different stages: stage of excitement, of collapse, and of convulsions. In all cases the temperature continued to rise up to the time of death, which is produced by respiratory paralysis; the pupil dilated, the blood black and fluid, the cranial membranes congested. The poison acts more rapidly when given subcutaneously than when taken in the stomach. The poison appears to possess the peculiarity of paralyzing the sphincters of the bladder and rectum, while at the same time irritating the unstriped muscular fibres of the intestines, bladder, and iris, the convulsions which it produces resembling those of strychnine, differing from them, however, in the fact that the reflex irritability is decreased.—*Medicinisch-Chirurgische Rundschau*, July 1, 1888.

THE ANTISEPTIC AND ASTRINGENT PROPERTIES OF CAMPHORIC ACID.

Thirty or forty years ago M. Fuerbringer tested the value of this remedy as an antipyretic, but only found that it was inferior to salicylic acid. Nevertheless it may be used as a disinfectant in typhoid stools, and it is further claimed to produce a favorable action on night-sweats of phthisis. Since then this acid has been employed by Italian physicians, and recently M. Reichert (*Revue Générale de Clinique et de Thérapeutique*, July 5, 1888) affirms its power over the bacilli of tuberculosis after the administration of intra-peritoneal injections. As a consequence he proposes its use in its double rôle of astringent and microbicide in the treatment of laryngeal phthisis, and he recommends its topical application, in two, three, four, or six per cent. solutions, applied to the diseased localities. Further, he states that he has seen it cure eczema and acne. Unfortunately, the alcoholic medium renders its properties entirely inert, and in view of the contradictions by Reichert and Fuerbringer we must wait for further testimony before admitting the marvellous properties claimed for this drug by the former.

THE LOCAL TREATMENT OF DIPHTHERITIC ANGINA BY SALICYLIC ACID.

M. Ory utilizes the antiseptic and parasiticidic properties of this substance in applying it locally to the pharynx when the seat of diphtheritic membrane (*Revue Générale de Clinique et de Thérapeutique*, July 5, 1888). The formula which he uses is: Infusion of eucalyptus, ℥iii½; glycerin, ℥iii; salicylic acid, gr. v; cherry-laurel water, ♏xvi. This may be painted on the mucous membrane by means of a brush every hour during the day and every two or three hours during the night, and Ory claims that, combined with good feeding, this method will

yield the most satisfactory results. The salicylic acid slightly irritates the mucous membrane, while the brushing serves mechanically to loosen the false membranes.

Reviews.

INTUBATION OF THE LARYNX. By F. E. Waxham, M.D.
Chicago: Charles Truax, 1888.

The historical, anatomical, and clinical features of intubation of the larynx are all given in the above volume, and Dr. Waxham has given them well. His labor has evidently been one of pleasure, and his advocacy for the operation is enthusiastic in its favor. This operation is essentially American, although Bouchut, of Paris, in 1858, was the first to advocate and perform it. His method and instrument were, however, so unsuitable for the success of its general acceptance by the medical profession, that a committee from the Paris Academy of Medicine, after investigating the new operation, reported unfavorably of it, and it passed into oblivion, until Dr. O'Dwyer, of New York, in 1880, began his experiments, "being unaware of the efforts and failure of Bouchut." The results of Dr. O'Dwyer's labors in this field of medicine have been published at different times by him in the journals. The improvements made in the instruments to be used, and the manipulations to be employed in performing the operation, which have been devised by him, have been such as to lead to an investigation of the operation by other surgeons, so that at the present time, if the operation has not been generally accepted, it has been favorably received by many, and we think it has now come to stay; not that we believe it will ever entirely supersede the operation of tracheotomy in cases of croup, but that in it we have added to our list of remedies another measure which may be resorted to in the treatment of this very fatal affection.

The work done by Dr. Waxham, in publishing his book, is to be much commended. He has given us a very practical description of the necessary directions for the successful performance of this operation, and while we are in accord with him in believing it absolutely essential for the satisfactory performance of any surgical procedure that personal experience in performing it will alone lead to perfection, yet it is also equally necessary that one should be familiar with the various steps of an operation before undertaking it, therefore we would advise all surgeons, who are desirous of learning the method of performing intubation of the larynx, to study the directions given by our author.

J. H. C. S.

LECTURES ON DISEASES OF THE EYE. By Charles Bell Taylor, F.R.C.S. and M.D., Edin.
London: G. Redway, 1888.

The above work consists of six lectures, delivered by the author at the Nottingham and Midland Eye Infirmary. They were published in the *Lancet*, and the subjects considered are "Cataract," "Squint," "Glaucoma," "Optico-Ciliary Neurotomy," "The Use and Abuse of Mydriatics," and "Eye-Troubles in General Practice."

The author's treatment of these different eye-lesions, their causes and results, are given in an easily understood and concise manner; indeed, as stated, they are for the general practitioner and student rather than for the specialist, and to the former we would refer them for much valuable instruction on these subjects. Where so much depends upon a correct appreciation of a case, as it so frequently does in eye-lesions,—the mistaking a slight case of iritis for mere conjunctivitis; the danger of using atropine in cases of inflammatory glaucoma; the error of considering a case myopia, when an ophthalmoscopic examination discloses it to be one of congenital cataract; and many other affections, which are so often met with by the general practitioner, may in many instances be advantageously treated if promptly recognized, or perhaps, what is better, be referred to one more experienced in these affections. These lectures, if they do nothing more than direct attention to the importance of a proper understanding of the subjects treated, will have done much; but we think, if they are carefully studied, they will do more,—they will teach how to act in such cases.

J. H. C. S.

ATLAS OF VENEREAL AND SKIN DISEASES. By Prince A. Morrow, A.M., M.D., Clinical Professor of Venereal Diseases, formerly Clinical Lecturer on Dermatology in the University of the City of New York, Surgeon to Charity Hospital, etc., Fifth and Sixth Fasciculi.
New York: Wm. Wood & Co.

We have already had occasion to speak of the first four fasciculi of this atlas. The fifth and sixth parts, now before us, bear out, upon the whole, the favorable opinion then ex-

pressed. These two fasciculi are devoted entirely to a delineation of the various syphilodermata. The five plates of the fifth part present eight colored figures, illustrating the annular syphilide, the general pustular syphilide (with chancre of the lip), the large pustular syphilide, syphilis cutanea ulcerosa, and the pustulo-crustaceous syphilide (rupial syphilide). These are all copied from the works of Neumann and Kaposi, and may be considered, with one or two exceptions, as creditably representing the originals. Plate XXIV., of syphilis cutanea ulcerosa, deserves special commendation, although possibly a trifle too highly colored. Plate XXV., exhibiting, in two figures, the various stages of the pustular syphiloderm of the rupial type, is also an excellent representation.

The sixth fasciculus has, in the five plates, eleven colored figures. In this part are portrayed the tubercular syphilide, the serpiginous syphilide, the tuberculo-ulcerous syphilide, ulcerative gummata, the serpiginous ulcerous syphilide, syphilis cutanea ulcerosa et vegetans, and the ulcero-gummous syphilide. Plate XXVI., from Kaposi, of the tubercular syphilide, is, we think, a poor selection, as it fails to give the student a clear idea of the manifestation of the disease. The author's own experience must include many cases of this type much more satisfactory and characteristic for atlas representation. The cases figured in Plate XXVII., showing the serpiginous syphilide, and Fig. 1, Plate XXVIII., showing the ulcerous syphilide, are from the author's practice. With these three exceptions, the cases exhibited in this (sixth) fasciculus are taken from Kaposi's work. Plates XXVIII. and XXIX., with two figures each of the ulcerous syphilide, are good illustrations of this form of cutaneous syphilis, and are artistically colored.

The text accompanying the plates, while concise, is clear, and, for the purpose, sufficiently comprehensive.

Correspondence.

PARIS.

(From our Special Correspondent.)

The *removal of tattoo-marks* has always been considered a very difficult feat. Many methods have been recommended at various times, a pretty sure sign that none of them is very satisfactory. Dr. G. Variot, of the Paris Biological Society, has recently proposed a new process, with which he claims to be invariably successful in removing blue and red tattoo-marks. Without hazarding an opinion beforehand, one must admit that the method is based on apparently sound principles. But it is, perhaps, well here to remark that Dr. Variot is attached to the central infirmary of the Paris prisons, and therefore in excellent position to experiment with such disfigurements, since, for some inscrutable reason, criminals, who have most to fear from identification, are just the men who most often brand their persons with indelible marks. Dr. Variot operates as follows: The tattooed parts are first wetted with a concentrated solution of tannin, and with a set of tattooing-needles the skin is punctured all over the colored portions to the depth usually adopted by professionals. All the parts tattooed with tannin are next rubbed over with the lunar-caustic pencil, the silver salt being allowed to act upon the epidermis and derma until the needle-pricks have turned a deep black. The excess of liquid being now wiped off, things are allowed to follow their natural course. The whole surface treated will soon turn black. The pain, quite moderate during the operation, will be slight for the first two days, and accompanied with some local inflammation. After the third or fourth day no more pain is felt, and, unless for large marks, no dressing will be necessary. After fourteen or eighteen days the eschar will fall off, and leave, instead of the tattoo-marks, a reddish superficial cicatrix, which will gradually turn paler, and, after two months, almost disappear. On close scrutiny it will probably remain always perceptible, but it will otherwise be scarcely noticeable, and, at all events, the skin will show no trace of the former emblems, more or less artistic. In explanation of the remedy's mode of action, Dr. Variot thinks that the coloring-matter forming the tattoo-marks are generally localized in the upper third of the derma, the deeper portions remaining unaffected. On tattooing at first with tannin, the solution penetrates exactly to the same depth as the foreign particles, and, acting as a mordant for the silver nitrate, enables the caustic solution to permeate the derma to the proper depth and no further. Hence the skin will preserve its elasticity, and the scar be so little apparent. Before finding out the foregoing process, others were unsuccessfully tried on prisoners, at their request, and it may not be useless to here briefly point out their imperfections. Blisters, even kept up some time, proved entirely insufficient. They do not reach deep enough. Red-

hot iron was found unmanageable and dangerous, too short an application being useless, and a too long one leaving painful sores and ugly scars. As to tattooing with a number of blistering or caustic solutions, including silver nitrate, they were scarcely satisfactory, although coming nearer the mark. Their main fault was to be exceedingly painful, even when the punctures were not deep enough. But when tannin was first applied, and then lunar caustic, the results were all that could be desired.

The effects of chronic *lead poisoning* on man are well known enough, but the way domestic animals are affected under the same circumstances is not so familiar. And yet a better knowledge of the symptoms would often be of some usefulness, as it would supply a clue to the cause of obscure epidemic poisonings. An interesting contribution to this branch of toxicology has been incidentally supplied by Dr. Cornillon, one of the physicians and chemists delegated to investigate the poisoning cases which not long since occurred at Gannat, near Vichy. The lead was introduced into flour through the ignorance of a workman, who had plugged with white lead a defective millstone in a mill which used to grind all the village corn. Of course the plumbic carbonate dropped off, got mixed with the flour, and poisoned nearly every one around. Among human patients the symptoms were, with a few exceptions, the customary ones. But domestic animals, fed with the same bread, afforded very curious indications. In some families the dogs were wont to be restless and bark in a most fearful manner, and so ceaselessly that their masters, thinking them mad, had them killed. Chickens simply died; hens bore the poison better, but stopped laying eggs. In one farm, after all the family had been sick, they had quite a quantity of the poisonous flour left, and tried to feed it to pigs. But three of the animals, which were sold soon after, died at the buyer's, and the three others first refused to eat for several days, and finally died. Their gums had the characteristic blue tinge, and obstinate constipation was observed, indicating saturnine paralysis. Another particularity worthy of remark was that, while hens ceased to lay, menstruation troubles among the Gannat women were unusually prevalent.

The quarrel in respect to the nature of the free acid existing in gastric juice still continues with varying fortunes. When Gunzburg's test—that is, the red color afforded with vanillin-phloroglucin in the presence of mineral acids and absent in that of most vegetable acids—was discovered the partisans of free muriatic acid exulted. But their triumph will not pass unquestioned. The test in question has, to begin with, proved unreliable in many cases, sometimes showing muriatic acid when none exists, and sometimes failing to detect it when purposely added. Another objection to free muriatic acid is that no one so far has tried to explain how so powerful a mineral acid could remain uncombined in the presence of the weak organic salts, lactates, tartrates, citrates, etc., which accompany it in gastric juice. The last argument, however, does not apply to Gunzburg's test. But M. V. Poulet, of Plancher-les-Mines, has unintentionally made a direct thrust at vanillin-phloroglucin, and proved the test to be at fault with at least one vegetable acid,—namely, hippuric acid,—which he showed, some six years since, to be a common constituent of gastric juice. According to his experiments, when Gunzburg's test is heated gradually with hippuric acid, extracted from urine of herbivoræ, the fine red color supposed to be characteristic of mineral acids is developed. Only hippuric acid requires a heat of 105°, while muriatic acid begins to act at 75°. With normal human gastric juice, or with the scrapings of pig, mouse, or chicken's stomachs, the same result was noticed, no change occurring until the temperature of the stove had been carried up to 105° or 108°. But, in M. Poulet's opinion, too much weight should not be attached to the behavior of so capricious a test as vanillin-phloroglucin. He, therefore, tried to extract the gastric juice acid in nature, without chemical additions, and by dialysis succeeded in obtaining several specimens weighing two or three decigrammes. In justice it must be confessed this is more than physiologists have ever done with muriatic acid, the processes followed affording no assurance against unknown chemical decompositions. And, finally, hippuric acid gives with silver nitrate a curdled precipitate which very much resembles the classic argentic chloride, with this difference, however, that, on heating, the chloride simply fuses, while the hippurate is reduced to metallic silver at a comparatively low temperature. The resemblance in the looks of precipitates has, according to M. Poulet, misled most experimenters so far into the inference they were dealing with silver chloride, and his conclusions are that Gunzburg's reagent—the pretended unfailable test of mineral acids—is, on the contrary, the best

proof that hippuric acid, and not muriatic, is the free acid of gastric juice. A plain chemist would, perhaps, like to know how those silver precipitates behave with other reagents, —nitric acid, for instance. But physiologists seem to have a chemistry of their own.

A new poisonous alkaloid has been found by MM. Hardy and Gallois, and by them named *anagyrine*. It is extracted from the *Anagyris fœtida*, a plant of the Leguminosæ family, growing on the Mediterranean shores, and especially Algeria, where it is commonly known as *bois-puant*, stinking wood. As the fruits much resemble common beans, frequent poisonings of domestic animals, and occasionally of men, have occurred. To extract the alkaloid, acetate of lead is added to a cold maceration of the bean, the precipitate filtered out, the excess of lead removed with hydrogen bisulphide, and after concentration mercuric chloride is added to the liquor. Another treatment with the bisulphide will free the alkaloid from its mercuric combination, and purification may be effected by the usual successive and repeated transfers from chloroform to acidulated water, and finally absolute alcohol. Anagyrine, as obtained by MM. Hardy and Gallois, is an amorphous yellowish substance, soluble in water, alcohol, ether, and chloroform. It forms with acids easily crystallizing salts which present all the characteristic reactions of alkaloids. Both the base and its combinations are poisonous. The muriate, experimented with by Drs. Bochefontaine and Gley, causes in warm-blooded animals vomitings, tremors, and loss of muscular motions up to incipient paresis; the breathing motions first become slower, and finally stop, so do the heart's beatings. With frogs the most striking symptom is the loss of muscular motions, the heart continuing to beat long after all other contractions have ceased.

While on the chapter of new vegetable poisons, it may be stated that further investigations have been made on *ouabaïne*, the African arrow-poison principle which was recently alluded to in this correspondence. The substance having proved to be of nearly the same chemical composition as *strophanthin*, also a glucoside, Dr. E. Gley has undertaken to compare the physiological effects of the two poisons, and found them to be also very similar. Both act upon the bulbo-medullary nervous system (causing breathing troubles and vomitings) and the cardio-vascular apparatus (acceleration and increase of cardiac contractions first, and finally stoppage of the heart). When injected hypodermically, $\frac{1}{40}$ of a milligramme ($\frac{1}{2400}$ of a grain) of ouabaïne will in six minutes cause the heart of a frog to stop in systole. Strophanthin will do as much in the same dose, but requires twelve minutes. Guinea-pigs weighing one-half a kilogramme (eighteen ounces) are killed in twenty-five minutes with $\frac{1}{20}$ of a milligramme of ouabaïne, while twice as much strophanthin is necessary to bring on the same result. Dogs and rabbits were also experimented with; but not to occupy too much space with details, suffice it to say that both ouabaïne and strophanthin were found to be much less poisonous when taken through the stomach than when injected into the veins, and that, as a rule, ouabaïne proved twice as poisonous and twice as rapid in its effects as strophanthin. As both glucosides are produced by African plants of the Apocyneæ family, strophanthin from a seed, and ouabaïne from the wood of a tree, the Dark Continent must be admitted to be well provided with fine specimens of poisonous plants.

The *Tuberculosis Congress*—now we are coming to the white man's poison—has met and gone, after scoring a grand success for its inaugural meeting. Medical papers will, no doubt, give you full particulars, but it may not be out of order for one who was present at most of the meetings to say that all Europe was represented,—including Germany. Great Britain had many delegates from both medical and veterinary colleges, and the United States had at least four representatives,—namely, Drs. Austin Peters, of Boston, and R. C. M. Page, A. Jacobi, and Dr. Heinemann, of New York.

It will probably prove both interesting and instructive to readers of the THERAPEUTIC GAZETTE to hear how French courts deal with physicians and pharmacists who have poisoned a patient. The following is an illustration to the point: Last March Dr. Fleury, who was attending a patient at Cloyes, in Touraine, prescribed for him a mixture containing one gramme (sixteen grains) of atropine sulphate in one hundred grammes (three and a half ounces) of liquid. Pharmacist Bossuges was imprudent enough to dispense the mixture as prescribed, in consequence of which the patient was poisoned to death. This month both physician and pharmacist were up before the Chateaudun court, to plead to the technical charge of homicide through imprudence. The doctor said he meant to prescribe only one centigramme (five-sixths of a grain) of atropine, and by mistake wrote one gramme. Any one should have noticed the error. The phar-

macist in his defence said he dispensed the prescription as written, although the dose seemed to him abnormal, because Dr. Fleury was in the habit of using excessive doses of poisons. The court sentenced the doctor in six hundred francs (one hundred and twenty dollars) fine, and pharmacist Bossuges in fifteen days' imprisonment and four hundred francs fine. Of course, civil suits for damages will now follow.

PARIS, August 17, 1888.

HIGH ALTITUDES IN PHTHISIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—The discussions concerning the climatic influences of high altitudes in mountainous regions upon consumptives (*tubercula pulmonum*) are read in Colorado with more than the usual interest. We have all the various heights of altitudes here which could be desired, ranging from four thousand feet at Pueblo to five thousand feet at Denver, Colorado Springs, and many other cities and towns, in which a case of pulmonary consumption has never been known to originate. We also have at Leadville an elevation of ten thousand feet above the sea-level, a location at which your correspondent has practised medicine during the last ten years without knowing of even one case of consumption to have originated at this place, though many thousands of miners are constantly exposed to changes of temperature,—going into deep and wet mines and coming up out of them, exposed directly to the cold, piercing winds and snow-storms upon the surface in mid-winter. Children and women are completely exempt from any signs of pulmonary tuberculosis in this locality.

Leadville being the greatest mining camp on the face of our globe, it naturally invites immigration from every nation, except China, in search of fortunes. Hence such an opportunity to observe the effects of a high altitude upon all classes and conditions of a people is seldom offered to the physician. But there are some special advantages conferred upon this locality not given to many others. We are in a great basin of about nine miles in diameter, and from five hundred to eight hundred feet deep, once filled with water, but now dry. The great Rocky Mountain Range, dividing the waters of the Atlantic slope from those of the Pacific slope, lies only five miles to the west of Leadville, rising above Leadville three or four thousand feet, shutting off the severe currents of winds and the wintry storms from that direction. The Musquito Range of mountains lies about the same distance east of Leadville, and about three thousand feet above the streets of this city, breaking off all storms of winds and snows from us. Hence our climate is as even and regular during the entire year as it would be possible to find in any other equally high altitude in the world. There are many other favorable spots in the mountains of Colorado where consumptives would be benefited; but for fear you might not become interested in the descriptions of a country, but think it an effort to secure a free advertisement for my adopted State, I shall not venture further on that line.

I would most earnestly suggest to physicians who advise their consumptive patients to reside temporarily in a high, mountainous country, that such patients exercise great caution in ascending heights rapidly. A stop every few miles should be made at stations where the grade is steep. It is best, in coming to Colorado, to make Denver, Colorado Springs, or Pueblo the first stopping-point, before venturing to a higher altitude. A week or two lay-off is enough at a time; but this depends upon the patient's condition. There are many physiological reasons to justify the statement that tubercular consumptives will generally improve by a residence in the mountains of Colorado, and in many cases recover entirely from the disease. I shall in the near future, if permitted to do so, give the explanations of the physiological and other scientific reasons bearing upon the subject under discussion, in proof of the views in favor of sending consumptives to the mountains of Colorado for their real advantages.

J. J. CROOK, M.D.

LEADVILLE, COL., July, 1888.

IODIDE OF POTASSIUM AND ERGOT IN THE TREATMENT OF MENINGITIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—M. M., a little girl, of nearly 4 years, received a fall while descending a flight of steps, striking her head over the left frontal region. A slight contusion, with a moderate amount of swelling, was noticed, but no unfavorable symptoms were observed until three days after, when the child began to complain of headache, and became drowsy. On the fourth day convulsions set in, and

continued with increased frequency. As the child had partaken quite freely of nuts, her physician attributed her illness to derangement of the gastro-intestinal tract, and directed his treatment accordingly.

On the third day of her illness, and the fifth day after the fall, I saw the child in consultation. She was then comatose, with all four extremities rigid, the upper more so than the lower. The muscles of mastication were strongly contracted, so that the mouth could not be forced open. The eyes were drawn upwards and pupils contracted; abdomen sunken and tender; reflexes exaggerated.

The temperature ran from 104° to 105°; pulse, 140 to 160. As the mouth could not be opened, the following treatment was ordered per rectum:

Head elevated; ice applications constantly to head; iodide of potassium, gr. v, with fl. ex. of ergot, gtt. xx, every four hours. Half-ounce of milk, with one drachm of brandy, every hour. For the first (twenty-four) hours after treatment began not much improvement was made, except the convulsions, which had been as many as eight an hour, ceased, and the temperature abated some. In forty-eight hours the limbs became relaxed, and the mouth could be opened. Nourishment was now given by mouth, with an extra five grains of pot. iodid., making ten grains every four hours.

On the third day of treatment the child partly regained consciousness. After this convalescence was rapid, and the patient made a good recovery.

Respectfully,

C. G. GIDDINGS.

ATLANTA, GEORGIA.

TREATMENT OF TROUBLESOME COUGH.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Permit me, through the medium of the GAZETTE, to call attention to a mixture which I have found of singular efficacy in a form of troublesome cough, viz., that often met with after an ordinary attack of influenza, and characterized by its violence and paroxysmal nature, with scanty expectoration, worse in early morning and towards night, and often accompanied with violent frontal headache, general debility, nausea, and gastric irritability. Physical examination of the lungs generally reveals nothing abnormal, and the cough seems to depend entirely on an irritable condition of pharynx and larynx. The following mixture I have found a specific in such cases:

℞ Cocaine hydrochlor., gr. ii;
Morphinæ sulph., gr. iss;
Ext. glycyrrhiz. liq., ♏xx;
Glycerini, ♏xx;
Aquæ, q.s. ad ℥iv. M.

Sig.—One dessertspoonful every two hours, till the cough is relieved, then less frequently. To be swallowed slowly.

When gastric irritability is marked, I prescribe as well Kepler's extract of malt, with or without cod-liver oil, as the case demands.

Ringer advocates a mixture of morphine with glycerin or liquorice in similar coughs, but this is not nearly so efficacious as the addition of cocaine renders it.

Yours respectfully,

HENRY O'B. DECK, M.B.

MOTUEKA, NELSON, NEW ZEALAND, June 15.

Notes and Queries.

THE CONGRESS FOR THE STUDY OF TUBERCULOSIS.

The following account of the proceedings of the Congress for the Study of Tuberculosis, held in Paris, is made up from the reports of the meeting published in the *Medical Press and Circular*, August 8, 1888, *Boston Medical and Surgical Journal*, August 23, 1888, and the *Medical Record*, August 25, 1888.

The first session of this important gathering, whose recent organization, with Chauveau for president, Verneuil and Villemin for vice-presidents, is one of the indices of the progress of the age in experimental pathology, was held in the amphitheatre of the École de Médecine, Paris, July 25 to the 31st ult. There was a fitness in the election to the highest offices in this Congress of two men who have done so much to advance our knowledge of the true nature of tuberculosis,—Villemin, who may be said to have been the pioneer in researches of this kind, having been the first to prove the infectiousness of tubercle; and Chauveau, who was the first to confirm Villemin's discovery, to demonstrate the transmission of tubercle by the digestive passages, and show the differences which exist between true and false tubercle.

M. CHAUVEAU, who presided, opened the *séance* by a short discourse, in which he called to mind the recent researches which led scientific men to believe that tuberculosis was an

infectious disease. Villemin, Koch, Pasteur, etc., contributed largely to this result. However, the Lyons School went a step farther, a step which they all considered exceedingly important. The savants of this school inquired diligently into the points of analogy between tuberculosis in the lower animals and that in man, and finally came to the conclusion that the affection was identical. Consequently, it was quite natural that veterinary surgeons and doctors should meet together in solemn counsel to study the best means for the prevention of the disease which was the plague of humanity.

M. CORNIL opened the discussion by saying that the mucous membrane need not be abraded in order to permit the penetration of the tuberculous bacilli. His friend, the honorable president, had succeeded in determining tuberculous intestinal lesions by the simple ingestion of milk containing a certain quantity of bacilli. M. Dobroklonsky repeated this experiment and arrived at the same result. He had himself examined the uterus in the cases of women of 65 and 82 years of age. Beneath the epithelium he found tuberculous granulations, and the contagion was evidently caused directly by the penetration of the mucous membrane by the bacilli. He experimented on rabbits per vaginam with cultivated tuberculous bacilli. After thirty-two days they had spread into the neighboring tissues. He concludes from this that tuberculous infection can be introduced by means of the genital organs into the system by semen containing bacilli without any abrasion of the surface.

M. NOCARD, from Alfort, spoke on the dangers caused by tuberculous milk and meat. The former as a precautionary measure should always be boiled, and that of tuberculous cows should be forbidden, except perhaps for the food of domestic animals; and in cases in which fresh milk is required, it should be that of goats, because not one case is known of that animal having contracted tuberculosis. As regards the meat, different opinions have been expressed for some years concerning its use, but now the French government has placed it under the same restrictions as the meat of animals affected by other epizootics. It is forbidden if the disease has invaded the body generally. The speaker finds these measures sufficient, and concludes, from his experience, that tuberculosis is very rarely found in all the organs, and that in any case the animal does not remain long in that condition. He maintained that the meat of tuberculous animals is not the cause of the frequency of that disease in the human system, and that the dangers of infection by meat are not very great.

There is no doubt as to the possible contamination by bacilli of milk. As a certain percentage of milch-cows are tuberculous, it is advisable always to boil, before using it, the milk served in cities. The sale of milk from cows known to be tuberculous should be absolutely interdicted.

The same may be said of meat, though the juice of flesh of tuberculous animals is rarely capable of determining tuberculosis. Out of forty guinea-pigs which Nocard had inoculated with one cubic centimetre of the juice of meat from tuberculous cows, only one became tuberculous (succumbing fifty-seven days after the injection). It seems, then, that in some rare cases tuberculosis is a disease *totius substantiæ*, but this generalization of the malady is but transient, blood and muscular juice very rapidly ceasing to be virulent. Experiments on cats (an animal known to be susceptible to tuberculosis), which were made to ingest tuberculous meat, and not one of which became tuberculous, have shown the comparatively little danger there is from this source. Cooking, moreover, of course renders such meat much less virulent.

The greater part of the following day (July 26) was devoted to the discussion of the paper of M. Nocard. During this discussion many important facts were brought out.

BAILLET, of Bordeaux, thought that the meat of tuberculous animals played but a trifling rôle in the transmission of tuberculosis to man: thus, at the slaughter-houses of Bordeaux, out of twenty-two thousand head of cattle only forty were found which were tuberculous; by the side of this small number of sick animals, the official statistics give one thousand phthisical persons to a population of two hundred and fifty thousand. It would seem from this that the influence of diseased meat on the propagation of tuberculosis in the human race plays a decidedly secondary rôle.

M. SPELLMANN, of Nancy, said that tuberculosis was very frequent in the stables of Hautes-Vosges, the mortality of cows from phthisis being thirty to forty per cent. The meat of these animals, bought at a low price and offered for sale in the neighboring towns, constitutes a permanent danger of infection.

GUIRAUD, of Montanban, stated that at Montanban it had been found that there was one phthisical animal to every two hundred

and forty-five head of cattle; while VILLAIN, of Paris, said that in the metropolis of France the proportion of phthisical animals is six per one thousand, at least for the abattoirs of Villette and of Grenelle.

THOMASSEN, of Utrecht (Holland), gave some statistics as to the prevalence of tuberculosis among cattle in Holland; this is one-half per cent. With respect to swine the percentage is somewhat higher.

LIEGEN, of Luxemburg, had succeeded in tuberculizing four hogs by giving them meat to eat from a tuberculous cow.

ROBINSON, of Greenock (Scotland), spoke in favor of a total interdiction of tuberculous meat.

M. ARLOING, from Lyon, followed at length on the same subject. He thinks that tuberculosis can be stamped out of animals by better sanitary measures, and forbidding the use of meat of animals affected in that manner until practical measures are found to make them harmless. He finds that the meat is just as dangerous as the milk, and differed in a certain degree from the previous speaker on that subject. The principal point to bear in mind is that tuberculosis must be considered legally as one of the infectious diseases, and this will give to the different municipalities power enough to make by-laws dealing with the subject.

M. BANG, from Copenhagen, spoke of the dangers of tuberculous milk, especially when the mamma is affected by that disease, but that the risk of infection is much less if the mamma be healthy. He thought that the milk, to be disinfected, must be heated to 85° C.

M. BAILLET, from Bordeaux, considers that M. Arloing's conclusion was too drastic,—namely, to forbid the meat of tuberculous animals, for he had found that muscles of such animals very rarely contain bacilli, and that the flesh has a very small influence on man. It is a bad sign, and might be a cause of its being prohibited as food if the ganglia close to the meat are affected; but it must be strictly forbidden when the bacilli have invaded the organism as a whole.

Many other speakers followed on the same side, treating the subject at greater or less length.

M. GRISSONNANCHE read a paper on "The Early Diagnosis of Pulmonary Tuberculosis in Cattle." His experience as a veterinary surgeon, practising in the country, had led him to regard the early diagnosis of phthisis in cattle as a much more easy matter than that of glanders. Pulmonary tuberculosis is characterized from the first by tumefaction of the retropharyngeal glands; the inspiratory movements are irregular; a harsh friction-sound is heard on auscultation, resembling somewhat the sound produced by rubbing the thumb over a tambourine. The cough is short and not easily provoked, except by sharp percussion on the thoracic parietes,—a procedure which evidently causes pain to the animal. The disease is met with most frequently in cattle living together in herds, hence the necessity of its prompt recognition, and of the isolation of the affected animal.

M. VEYSSIÈRE opposed strongly the views set forth by M. Baillet, and hoped that the Congress would not endorse them. He thought the distinctions made between localized and generalized infection were too fine to be followed by the ordinary meat inspector, and insisted upon the rejection of any infected animal, whatever its general appearance of health may be. He had seized a very fat and apparently well-conditioned cow on account of a local tuberculosis, and had injected some of the juice expressed from the meat into two rabbits. Both animals died, and an examination showed the presence of tubercular alterations in the lungs and liver.

M. MOULÉ referred to the danger of infection by eating the flesh of tuberculous poultry, a matter which seemed to have been overlooked in the discussion hitherto. His observations had led him to believe that domestic fowls were very frequently the subject of tuberculosis, the disease often involving the abdominal organs. Thus *pâte de foie gras* was especially dangerous, being in some cases almost a pure culture of tubercle-bacilli.

M. THIERRY said that the inspection of meat in all the large cities ought to be most rigorous; while in the country such precaution was less necessary, for the butchers there were generally good judges of cattle, and rejected those that they considered unsound.

M. VILLAIN said that the proportion of tuberculous animals brought to the abattoirs of Paris was about six in a thousand head.

MR. ROBINSON, of Greenock, Scotland, said that, from an experience of fourteen years as meat inspector, he had come to the conclusion that tuberculosis in animals is comparatively rare, but that when it does exist, even in cases in which it seems to be most limited, a more careful examination will generally show the presence of glandular involvement. He urged

upon the Congress to pass some very strong resolutions against the use of the flesh of diseased cattle, for he did not think it possible to decide safely, in the case of tuberculous animals, between those that were fit to be eaten and those that were not, and it was necessary therefore, to exclude all.

M. GUINARD called attention to the danger which existed in the practice of drinking fresh blood at the abattoirs. He had seen a lady drink the blood from a fine-looking animal, which, however, was found afterwards to be diseased, and was condemned. This lady was already consumptive, but it was not uncommon for physicians to send patients with simple anæmia to the abattoirs, and for them the practice might be fraught with evil.

A resolution was then proposed to the effect that, in the opinion of the Congress, all animals affected in any degree with tuberculosis should be seized and condemned as unfit for food. This resolution was carried with only three dissenting votes.

M. DEGIVE made some brief remarks on "Tuberculosis and Vaccination." He said that it was the practice in Belgium to kill all the calves from which vaccine had been taken, and to reject the latter if the animal was found to be tuberculous.

The PRESIDENT said that this was certainly an excellent rule to follow, but one could easily exaggerate the dangers to be apprehended from this source. In the first place, it was only in very rare cases that the vaccine contained tubercle-bacilli, and even then experiments had shown that it was very difficult to inoculate an animal with tuberculosis through a superficial abrasion of the skin. The advantages of vaccination were too great to be counterbalanced by the almost infinitesimal risk of acquiring tuberculosis by this means.

M. SOLLES then read a paper on "A New Micro-organism found in the Lungs of Phthisical Patients." When this organism was introduced into the circulation of rabbits, the animals died with a disease very distinct from tuberculosis, but with constant and characteristic lesions. This microbe could also be propagated by cultures from the blood of consumptive patients. It was distinct from the tubercle-bacillus of Koch, as was shown by the fact that it did not take up Ehrlich's stain.

M. LANNELONGUE presented a communication on "Tubercular Hepatitis." He said that there were two forms of tuberculosis of the liver, excluding miliary tuberculosis,—viz., a tubercular infiltration or caseous hepatitis, and cavernous ulceration or tubercular abscess of the liver.

M. LA TORRE read a paper on "Hereditary Tuberculosis." He had come to the conclusion, from his observations and from the study of all attainable statistics, that the influence of a tuberculous father is more marked than that of the mother similarly affected. This was contrary to the generally received opinion.

M. DE BRUN, of Beyroot, presented a communication on "The Antagonism between Malarial Fever and Tuberculosis." The author said that he was struck on his first arrival in Syria with the fact that phthisis was much more rare there than in France. It could not be due to any advantages in the climate of the country, for the incessant rains of winter, the continued heat and moisture of the atmosphere in summer, and the depressing winds from the desert, all contributed to favor the spread of tuberculosis. The only explanation of the fact, therefore, that was at all satisfactory was furnished by the law of Boudin, who maintains that there exists an antagonism between malaria and tuberculosis. Tuberculosis was absolutely unknown in former times, when there was no attention paid to sanitation, but its advent coincided in time with the introduction of drainage, and other works designed to prevent malaria. Just in proportion as these works were successful and as malaria diminished, phthisis increased. Often, indeed, in malaria, there is pulmonary congestion, and this, taken in connection with the debility and lowered general vitality of those affected, not infrequently leads to a diagnosis of phthisis, but the effect of quinine in dispelling all these symptoms discloses quickly their true character.

M. PIOT, of Cairo, related his experience with tuberculosis in Egypt, which, he said, had led him to conclusions similar to those of the preceding speaker.

M. REDARD read a paper on "The Surgical Treatment of Tubercular Arthritis in Children." He was in favor of opening widely the diseased articulation with the thermo-cautery, scraping away all the affected parts, whether bone, cartilage, or synovial fringes, and providing for subsequent irrigation. Recurrence of the disease was frequent, but after two or three operations a definite cure resulted.

M. VERNEUIL said that he had abandoned long ago resections, and other operations made by rule, in children. He favored scraping away the diseased parts, but he was

also in favor of previous sterilization of the tubercular centres with iodoform and ether. He had seen most excellent results from such measures.

M. CHANTEMESSE presented a communication, embodying the results of a series of experiments made by M. Vidal and himself, "To Determine the Persistence of Tubercle-Bacilli in River-Water." The authors had used the water of the Seine for this purpose, some being previously sterilized and some taken just as it flowed in the river. To various samples, some kept at a temperature of 45° to 50° F., and the rest at 60° to 70° F., pure cultures of tubercle-bacilli were added, and it was found that the micro-organisms were still present at the end of seven weeks, but the injection of this water into the peritoneal cavity of guinea-pigs gave negative results.

M. ARLOING reported the results of some experiments of MM. Galtier and Cadéac to determine the length of time during which the virulence of tubercle-bacilli in stagnant and running water is preserved. Pieces of tuberculous tissue were placed in the bottom of a flask in which was maintained a stream of running water of a temperature of about 60° F. It was found that the micro-organisms were still active at the end of six weeks. In stagnant water the virulence was preserved for seventeen or eighteen weeks.

M. Arloing then read a paper embodying the results of some experiments of his own in the way of the prevention of tuberculosis after inoculation. He inoculated a certain number of guinea-pigs under the skin of the thigh. Seven days later he removed the inguinal glands from two of the animals, although the glands appeared to be healthy. On the fifteenth day three of the remaining animals presented some swelling of the glands, which were thereupon removed. Two animals remained which were not operated upon. Two months and a half after the inoculation the seven animals were killed, and all presented marked lesions of general tuberculosis. Thus it would appear that exsection of the glands had no effect upon the course of the disease.

The author then related some further experiments made with a view of testing the efficacy of preventive inoculations of tuberculosis. It had been thought at one time that scrofulous glands contained the tubercular virus in an attenuated form. He had accordingly practised inoculations with scrofulous material, subsequently inoculating the animals with unmistakable tuberculous products. The result was that tuberculosis developed, seemingly uninfluenced in its course by the previous inoculations. Other experiments with the previous repeated inoculations of typhoid virus showed that the latter exercised no restraining influence upon the course of the tubercular disease.

M. BABÈS presented a communication on "The Bacterial Relations of the Tubercle-Bacillus." He had noted the bacterial conditions in seventy-three autopsies made on children, sixty-five of whom had tuberculous glands, and had found Koch's bacillus in but forty-five. In fifty-two autopsies of cases of more general tuberculosis he had found the tubercle-bacillus alone in but ten instances. In all the other cases there were other microbes associated with it. These were most commonly the micro-organisms of suppuration, but, in certain special diseases, tuberculous in character, such as pleurisy, peritonitis, meningitis, etc., the microbes present were those usually credited with the production of the ordinary non-tubercular forms of the same diseases. He concluded that uncomplicated tuberculosis rarely causes death, at least in children, but it usually opens the door to other bacteria which induce the special and fatal forms of the disease. He believed also that latent, incapsulated tuberculosis, which is extremely frequent in children, under the form of scrofulous glands, may become active in the course of affections excited by other micro-organisms.

M. DURET then read a paper on "Tuberculosis of the Glands." He recognized three forms of the affection,—1. Fibrocaseoma; 2. Simple caseo-tuberculosis; 3. Suppurative caseo-tuberculosis. The treatment of the first form should consist in extirpation of the affected glands. In the second form the author advised igni-puncture and scraping out of the caseous material. In the third form, in which ulcers or fistulous tracts exist, his plan was to destroy the fungous granulations with the thermo-cautery.

M. CORNIL presented a communication, on behalf of himself and M. Toupet, on "Pseudo-tuberculosis." The authors had examined a little tumor, the size of a pea, removed from the finger. It was composed of fibrous tissue, in the midst of which were certain small nodules, having all the appearances of tubercles, and containing within them perfectly characteristic giant-cells. The degenerating cells, found around the giant-cells in typical tubercles, were, however, absent in this case. Repeated careful examinations failed to re-

veal the presence of the bacilli of tuberculosis. Upon the strength of this and other similar tumors observed by the authors, they concluded that the presence of the pathological formation, known as tubercle, was not always an evidence of the disease tuberculosis, and that, therefore, it was not possible to rely with certainty upon the anatomical diagnosis, and the latter should always be supplemented by a bacteriological examination.

M. Hurean de Villeneuve read a paper on "The Use of Raw Meat and Blood in the Alimentation of Consumptives." He thought that the exclusive use of these substances was bad for tuberculous patients. A more rational treatment consisted in the administration of strychnine and arsenious acid, which drugs, given in sufficient doses, tended to excite a good appetite. When the desire for food was once aroused the only indication was to satisfy the patient with an abundance of good nourishing food such as pleased his palate.

M. Cartier sent a communication on the same subject. He recommended the flesh of the sheep or goat as most suitable to be eaten raw. If it was considered desirable for a patient to drink fresh blood, that coming from these same animals should be chosen by preference. The writer had himself drunk sheep's blood, and said that, with his eyes shut, he would have supposed that he was drinking milk fresh from the cow. There was nothing in the least disagreeable in its taste.

A SPANISH PHYSICIAN ON POSTURE IN LABOR.

Dr. Francisco Alonso Rubio, in a paper read before the recent Spanish Gynæcological Congress, laid great stress upon the important part that the posture of the patient plays during labor, both physiological and abnormal. During the first stage, he merely keeps the patient from going from one room to another, to avoid catching cold. During the expulsive stage, though he prefers the supine, or, at least, a horizontal, position as a rule, he changes it to a sitting posture where there is asthma or cardiac weakness, also where the pains have become inert through uterine fatigue. Where there is any version of the uterus, it is necessary to pay due regard to its direction. Thus, if there is anteversion, the patient should be placed on her back; if there is lateral version, she should lie on the side opposite that to which the fundus uteri is inclined, so as to bring the fœtal axis to coincide as nearly as possible with that of the pelvis. It is, of course, a recognized fact that a change of posture will frequently facilitate the descent of the head even when there is no abnormality either in the position of the child or of the direction of the uterine axis. When the fœtal position is transverse, the patient should be laid on the side opposite to that occupied by the head, with a pillow under the abdomen. The adoption of the genu-pectoral position has frequently been found of service by Dr. Rubio. When there is prolapse of the cord, and it is being dragged upon in a dangerous manner, he raises it above the head, and keeps it there during several pains, the woman being placed in the genu-pectoral position. Again, in complicated presentations, he has found this the best posture for their reduction, and in arm-and-shoulder presentations, where the amniotic liquid has escaped, and the practitioner in attendance has been unable to insert his hand and turn, Dr. Rubio, by the adoption of this position, has found it possible to execute the necessary manœuvre.—*Lancet*, July 28, 1888.

A NEW BASE IN TEA.

In the examination of large quantities of tea-extract received from Dr. Fr. Witte, of Rostock, A. Kossel (*The Pharm. Journal and Trans.*, July 21, 1888) has ascertained the presence of a new base that is associated with theine in minute proportion. The sirupy extract was operated upon in the following manner: After mixing with water sulphuric acid was added to separate smeary products, and the resulting liquid was supersaturated with ammonia. Ammoniacal solution of silver nitrate was then added, and the precipitate thus formed was collected by filtration. The precipitate was digested with warm nitric acid, the mixture filtered to separate silver salts that had deposited, and the filtrate made alkaline with ammonia. In the course of twenty-four hours a brownish amorphous precipitate was deposited, which contained the new base in the state of a silver compound, and by evaporating the clear filtered liquid a further quantity of this silver compound was obtained. After separating the silver from this compound by the treatment with sulphuretted hydrogen and filtering, a small quantity of xanthine was deposited from the clear filtrate, and upon concentrating the liquid the new base partly crystallized out. The mother-liquid was then mixed with mercuric nitrate

solution, the precipitate collected by filtration, and the filtrate made alkaline with sodic carbonate solution. A white precipitate was thus obtained in both cases, which consisted almost entirely of a mercury compound of the base.

Analysis of the new base, for which he suggests the name "theophylline," gave the following results:

	I.	II.	III.	Calculated for $C_7H_8N_4O_2$.
C.....	46.55	46.63	.....	46.77
H....	4.70	4.77	.....	4.44
N....	.....	.....	31.66	31.11

The crystals contain one molecule of water, which is given off by heating to 110° C.

The composition of theophylline is the same as that of theobromine, as well as that of paraxanthine obtained by Thudichum and Salomon from urine, but the characters of the base are different from those of either substance. The crystals are larger than those of theobromine, and the latter do not contain water. Theophylline is much more soluble in water than theobromine, and on the addition of a very small quantity of ammonia it dissolves very readily apparently in any proportion, while theobromine is but sparingly soluble in strongly ammoniacal water. The crystals of paraxanthine have been examined by Arzruni, and Dr. Scheibe has compared the crystals of theophylline with his description, with the results that they do not correspond. The melting-point of theophylline is about 264° C., while that of paraxanthine obtained from Dr. Salomon is 280° C. Theobromine sublimes at 290° C. without melting. Theophylline also sublimes at a temperature above its melting-point.

Theophylline forms definitely crystallizable salts with hydrochloric and nitric acids, platinum chloride and gold chloride, as well as a crystallizable sparingly soluble double salt with mercuric chloride. In a pure state the base is not precipitated from a dilute solution by mercuric chloride.

Paraxanthine forms, as Salomon showed, a sparingly soluble compound with soda, which separates in crystals on adding caustic soda solution to a dilute solution of the base. Theophylline also forms a compound with soda, but it is readily soluble, this difference between the two bases being very marked.

Theophylline resembles theobromine in forming a silver compound which separates in an amorphous state on adding silver nitrate to a water-solution of the base. This compound is soluble in warm ammonia, and on cooling the solution it crystallizes out. The compound thus obtained and dried at 130° C. contained 37.18 per cent. of silver, corresponding to the formula $C_7H_7N_4O_2Ag$. This silver compound dissolved readily in nitric acid.

When theophylline is mixed with chlorine-water and the liquid evaporated, a scarlet-colored residue is left, which becomes violet on addition of ammonia, just as is the case with theobromine.

The great similarity between the characters of theophylline and theobromine suggest that these substances are both derivatives of xanthine, and with that idea the introduction of the methyl group was attempted. By heating the silver compound with a calculated proportion of methyl iodide and some methyl alcohol in a closed tube for twenty-four hours at a temperature of 100° C., a crystallizable product was obtained which showed on analysis that a methyl group had been taken up, the composition and characters agreeing perfectly with those of caffeine. The melting-point of the substance thus obtained was 229° C., and accordingly from this experiment it may be inferred that theophylline is a dimethylxanthine. The positions of the methyl groups have yet to be determined by an oxidation experiment.

THE DETECTION OF SACCHARIN.

This product, prepared from that apparently never-ending source of new compounds, coal-tar, has now found its way into so many valuable therapeutic preparations that the identification of its presence has become important. Its composition is expressed by the formula $C_6H_4\begin{Bmatrix} CO \\ SO_2 \end{Bmatrix} NH$, and the name given to it by chemists is, therefore, benzoyl sulphonic imide. It combines easily with bases,—indeed, even with alkaloids; and displaces the carbonic acid in alkaline carbonates, salts being formed which are very much more soluble in water than saccharin itself, and which do not lose in any degree the well-known powerful sweet taste. It is on account, in fact, of its poor solubility in water that most of the saccharin preparations of commerce contain it, combined with a base,—carbonate of sodium being very generally used. If to such a solution a little sulphuric acid be added, saccharin is thrown down as a white amorphous powder. With alkaloids, such as quinine and morphine, the reverse is the case; they are soluble in acids, forming salts from

which the alkaloid may be precipitated by the addition of a base or alkali. Hence the following simple method for the separation of saccharin from preparations said to contain it, such as biscuits, bread, cakes, etc. The sample is macerated thoroughly with water, to which a little solution of carbonate of sodium has been added. The liquid mass is then filtered, and the clear liquid made acid with a little sulphuric acid. It is then shaken up with ether. The ether will readily dissolve the saccharin which has been freed by the acid. The ether is then drawn off and evaporated, and if saccharin is present a white residue of intensely sweet taste will be obtained. The residue may be examined further. When saccharin is fused with a mixture of nitre and carbonate of sodium the fused mass contains sulphuric acid. Accordingly, if the mixture is dissolved in water and acidified with hydrochloric acid, the addition of barium chloride gives a white precipitate of barium sulphate. Saccharin, when heated with a small quantity of caustic soda at 250° Centigrade for half an hour, is converted into salicylic acid, which can be separated by the addition of acid and ether, and detected in the usual manner, an aqueous solution of salicylic acid giving a beautiful blue coloration with perchloride of iron.—*The Lancet*, July, 14, 1888.

RICIN, A TOXIC FERMENT CONTAINED IN CASTOR-OIL SEEDS.

It has long been known that the seeds of the castor-oil plant were poisonous, but the nature and properties of the toxic principle were very imperfectly known. A good deal of light has now been thrown on the question by the publication of a Dorpat graduation thesis by Dr. H. Stillmark, who has been working at the subject in Professor Kobert's laboratory. He finds that the only toxic principle contained in ricinus seeds is an albuminoid body, which he names "ricin," and classes among the so-called "unformed ferments." It is unaffected by dry heat of 100° C., but is destroyed by boiling. It acts, when administered by the mouth or by hypodermic or intravenous injection, by producing hemorrhagic inflammation of the gastro-intestinal tract, especially and primarily affecting the small intestine, and secondarily the stomach and large intestine. It usually also causes extreme fulness of the gall-bladder, probably by setting up some obstruction of the bile-duct; frequently also the bladder is found greatly distended with urine, the vesical mucous membrane being inflamed. In connection with these experimental results obtained by observations on animals, it is interesting to note that jaundice and anuria have been observed in some cases of accidental poisoning by castor-oil seeds in the human subject. Diarrhœa is by no means constant, constipation having been frequently noticed both in experimental and clinical cases. Dr. Stillmark has never observed the cholera stools in animals which have been described as occurring in cases of accidental poisoning. The drowsiness and convulsions which occurred in some of his experimental observations he is disposed to attribute to thrombosis of the cerebral vessels. As to the lethal dose, he finds that for animals it is .1 milligramme ($\frac{1}{440}$ gr.) per kilogramme of body-weight when the drug is injected into the veins, so that for a man weighing sixty kilogrammes it would be 6 milligrammes. As drugs administered in this way are perhaps ten times as active as when taken into the stomach, the ordinary lethal dose of ricin may probably be set down as about 60 milligrammes, a quantity contained in ten ordinary seeds. It must be observed, however, that Christison once had a fatal case where only "two or three" seeds had been swallowed. This seems to have been a very exceptional instance, as there are many cases on record where a much larger quantity has been taken without a fatal issue, —*e.g.*, Rapp reported a case where an Italian non-commissioned officer took seventeen ricinus seeds, and recovered; Bouchardat, on the other hand, had one where a girl of eighteen ate twenty seeds, and died in five days. Experiments on the physiological action of ricin showed that it possesses a peculiar effect upon blood. When this is defibrinated, ricin produces a conglomeration of the red corpuscles, together with the formation of a fibrin-like substance. When blood is freshly drawn from a vein ricin causes it rapidly to coagulate. Again, defibrinated blood is rendered capable of passing through a filter by ricin,—that is to say, the serum passes through, leaving the red corpuscles behind; an extremely dilute solution is sufficient for this,—1 of ricin to 60,000. No effect was produced by ricin on isolated nerves, or on the blood-pressure, and little or none on isolated muscles or on a frog's heart prepared according to Williams's method. Other Euphorbiaceæ were examined, especially the croton-oil plant, and an identical, or at all events a similar, poisonous principle was found in them. It was plainly proved by Dr. Stillmark's experi-

ments that the action of castor oil has nothing at all to do with ricin; also that croton-oil acid, which has been shown by Buchheim, Krich, Hirschheydt, and Kobert to exist in croton-oil seeds, is an entirely distinct body from ricin. These seeds therefore contain two virulent but distinct poisonous principles, —ricin and croton-oil acid.—*The Lancet*, July 14, 1888.

THE TOXIC DOSE OF OIL OF GAULTHERIA.

Since the demonstration that oil of wintergreen is nine-tenths a salicylate and resembles therapeutically the artificially-made salicylates, its use in medicine has become quite extended. Although it is a powerful drug, very few cases of serious poisoning by it have been reported, and hence a case recently coming under the observation of DR. J. G. PINKHAM (*Transactions of the Massachusetts Medico-Legal Society*, vol. i., No. 10) is of interest.

In Dr. Pinkham's case, the patient, a young woman, took an ounce of the oil for the purpose, probably, of producing abortion. Death occurred in fifteen hours. The symptoms were distress in the head, profuse perspiration, pain in the stomach and bowels, purging, diuresis, with frequent, painful, and, at the last, involuntary micturition, abolition of sight and hearing, general convulsions, tonic spasms of the flexors of hands and feet, great depression of the heart's action, and rapid respiration. Post mortem there was found persistent spasm of hands and feet, great irritation of the gastro-intestinal mucosa, a black fluid state of the blood, and congested kidneys.

Dr. Pinkham was able to find accounts of only four other cases of poisoning by oil of gaultheria, two of which were fatal. In the three cases which were reported in detail, the amount taken was about half an ounce; and, as in two of these the patients recovered, it may be said, therefore, that the fatal dose of oil of winter-green is from half an ounce to an ounce.

The symptoms are in many respects like those of salicylic acid. It is possible that the hydro-carbon gaultherilene, which makes up one-tenth of the drug, produces some modifications in the train of toxic phenomena.

It is pretty well established, by the cases so far observed, that at least two drachms of oil of gaultheria could be given without fatal result. As the ordinary dose is 10 minims to 18 minims, every few hours, the drug may be looked upon as a reasonably safe one.—*New York Medical Record*, July 28, 1888.

SOME NEW FACTS IN RELATION TO HYOSCYAMINE.

Some important facts have recently come to light in connection with hyoscyamine. At one time hyoscyamine, atropine, and daturine were considered to be distinct alkaloids, although isomeric. It had, however, been noticed that the alkaloids met with under these names were frequently admixtures, for instance, hyoscyamine has been shown to form a small part of medicinal atropine, a considerable part of daturine, and a very large proportion of light daturine. It has, moreover, been shown that the so-called duboisine obtained from *Duboisia myoporoides* is nothing more than hyoscyamine. It is now stated from the laboratory of the Chemische Fabrik auf Actien that either hyoscyamine or atropine, or a mixture of both, may be obtained from belladonna-root, according to the method of extraction adopted, and especially according to the range of temperature permitted during the operation. Both alkaloids were actually prepared by M. Will from root taken from the same parcel, and their purity established by an examination of their gold compounds. Hyoscyamine obtained from the root was converted into atropine by continued heating, and by treating with alkali and by the application of various other methods. The atropine thus formed yielded a finely-crystalline salt with sulphuric acid. It is considered as proven, therefore, that in good belladonna-root no atropine exists preformed, but only hyoscyamine, and that it is possible to obtain, by appropriate treatment, either one of these alkaloids or the other as may be desired, and that hyoscyamine is easily converted into atropine by the action of a small quantity of alkali. M. Will has also succeeded in obtaining at will either hyoscyamine or atropine from the seed of *Hyoscyamus niger*.—*Provincial Med. Journal*, July 2, 1888.

A NEW SURGICAL SOAP.

According to the Paris correspondent of the *British Medical Journal* for June 30, 1888, PROFESSOR AUGUSTE REVERDIN, of Geneva, speaks highly of a "surgical soap" prepared after the following formula: ℞ Oil of sweet almonds, 72 parts; lye (*lessive*) of soda, 24

parts; lye of potash, 12 parts; sulpho-carbolate of zinc, 2 parts; essential oil of roses, 9.5 parts. (Mem.—The preparation consists in slowly adding to and carefully mixing with the almond oil the lyes and the sulpho-carbolate part by part until an intimate and homogeneous mixture is obtained.) The latter is kept for several days at 20° C. The mass, which gradually acquires the consistence of soft paste, is then divided into any number of portions that may be desired; these are placed in suitable moulds, where they are kept till they are completely solidified. Professor Reverdin has been using this antiseptic soap since the summer of 1887, when he visited Professor Bottini's clinic at Milan, where it is extensively employed for various purposes. The soap is said to possess wonderful cleansing, as well as antiseptic, properties, and it does not irritate the skin, however sensitive or irritable it may be. Moreover, as the soap contains an excessive proportion of fatty substances, it does not dry the skin. The presence of potash makes the soap by far more active comparatively than a pure sodic soap, since, as Dr. Unna has proved, potash has a more energetic solvent action on the horny layer of the cuticle than soda. Professor Reverdin recommends this soap not only for general use in hospital and private practice, but also for washing the hands in dissecting-rooms and everywhere where the hands come in contact with decomposing substances. Further, he urges that barbers should universally adopt this disinfecting soap for their purposes, and thus protect their customers from various infectious diseases, to which they are exposed in their shops. Dr. Reverdin has also obtained good results from this soap in various cutaneous affections. Finally, it is a very pleasant toilet soap, as he himself and many of his patients and friends have found.

APIOL AND ISAPIOL.

As the result of heating apiol, the so-called parsley camphor, with alcoholic potash, Messrs. Ciamican and Silber have obtained a crystalline compound having the same composition as apiol ($C_{12}H_{14}O_4$), which they have therefore named "isapiol" (*Ber.*, xxi. 1622). It melts at 55–56° (apiol melts at 30°), and is soluble in ether, acetic ether, acetone, benzol, hot alcohol, and glacial acetic acid, but insoluble in water, alkalies, and carbonated alkalies. Both apiol and isapiol yield, upon oxidation with potassium permanganate in alkaline solution, a crystalline acid represented by the formula $C_{10}H_{10}O_6$, and named "apiolic acid;" but isapiol, when oxidized with potassium bichromate and sulphuric acid, yields a neutral compound ($C_{10}H_{10}O_5$). Isapiol has been tested physiologically and therapeutically in the Padua clinic, and is reported to exercise a pronounced influence upon the vaso-motor system. Small doses (.2 to .4 gramme) administered internally produced in half an hour excitation of the heart, with powerful pulse; larger doses (.6 to .8 gramme) were followed by a rebounding pulse, the effect continuing for several days after administration, when the preparation had been previously used for some days. Like apiol, isapiol induced headache and passing intoxication, and, after repeated ingestion, caused digestive disturbances, loss of appetite, and even fever. Against dysmenorrhœa it was useless, and also in a case of ague.—*Pharm. Journ. and Trans.*, July 28, 1888.

ANTIPYRIN IN SUPPRESSING THE MILK-SECRETION.

Dr. Salemi, writing to the *Bulletin Général de Thérapeutique* for June 30, 1888, states that, being called to a young primipara, of robust constitution, who from neglecting the symptoms of trouble in the breast was suffering so severely from fissures of the nipples as to prevent nursing, he employed a large number of different methods for arresting the secretion of the milk, but without avail. He finally administered antipyrin in a daily dose of eight grains, given at three different intervals. The secretion diminished on the first day, and disappeared on the third not to return.

THE TREATMENT OF HEMORRHAGE IN FIBRO-MYOMATA BY HYDRASTIS CANADENSIS.

In the *British Medical Journal* for July 21, 1888, Mr. Henry T. Rutherford reports four cases of hemorrhage in fibro-myomata, in all of which hydrastis checked the hemorrhage immediately. The preparations which he used were the tincture in doses of 15 minims to 1 drachm, and the fluid extract in doses of 15 minims to ½ an ounce. He finds that hydrastis may be taken continuously for a considerable time without any ill effects, and will be found to improve digestion and act as a stomachic tonic. It further possesses the advantage over ergot in not producing painful uterine contractions.

THE NEUROSIS OF HEART-DISEASE.

The nervous symptoms accompanying cases of heart-disease are often numerous, and their combination is frequently curious, and not always easily explained on physiological principles. Sometimes the physician finds a large heart with valvular disease, and simply faintness as the only troublesome symptom, and this but an occasional one. Physicians have not seldom been called upon to treat distressing nausea, sometimes with diarrhœa and without any signs pointing to an altered state of the mucous membrane; the heart cannot be said to have failed in its compensation; the tongue may be normally clean; the stools present nothing abnormal, except that they sink in water and are too loose, time not having been allowed for the natural changes incidental to residence in the large bowel. We all know the troublesome, often barking, cough not necessarily associated with congestion of the lungs secondary to the valvular deficiency. No doubt many of the symptoms are to be explained on the view of inequality, if not inadequacy, of the circulation through the abdominal and thoracic viscera, or through the brain and spinal cord; but it seems that we must recognize pure neurosis not so caused, and a careful study of the patient's previous and family history will bring out the neuropathic tendency as well as the rheumatic relationship. Sometimes, in fact, the nervous symptoms are not so much the effect of the heart-disease as of a pre-existing neurotic susceptibility which may have actually developed—for example, in chorea—before the rheumatism had involved the valves of the heart. Those who advocate the nervous origin of rheumatism would perceive nothing antagonistic to their belief in this mode of viewing the subject.—*Lancet*, August 11, 1888.

TRIBROM-PHENOL.

Tribrom-phenol, prepared by shaking a solution of carbolic acid with bromine-water, is one of the latest introductions for antiseptic purposes. Dr. Grimm finds that gauze containing two or three per cent. of this compound, when saturated with blood-serum or urine, remains perfectly odorless for fourteen days, while a one-per-cent. gauze only begins to smell after five days. When a one-per-cent. ammoniacal solution of this drug is added to putrescent blood-serum, the bacteria are stated to be destroyed in half an hour, while a half-per-cent. solution takes twice that time. A three-per-mille solution is said to prevent the development of putrefactive bacteria in a gelatin cultivation. Tribrom-phenol is prepared in the form of soft, white, colorless needles, melting at 95° C., and subliming undecomposed at a higher temperature. It is soluble in alcohol, ether, and chloroform, but is difficultly soluble in glycerin, carbolic acid, water, and weak alcohol. In caustic alkaline solutions it is readily soluble, and from them it is separated unaltered by acids. When given internally, it is dissolved by the alkaline secretions of the intestinal canal and eliminated in the urine as tribromo-phenol-sulphuric acid.—*The Provincial Med. Journal*, July 2, 1888.

COCAINE IN THE SURGICAL TREATMENT OF HYDROCELE.

M. Alezais utilizes the analogesic properties of cocaine to diminish the pain caused by injections of iodine in the treatment of hydrocele, the solution of cocaine first being injected into the tunica vaginalis, and then, after allowing it to remain a few moments, it is evacuated and replaced by the solution of iodine, which is then stated to cause no pain whatever.—*Revue Générale de Clinique et de Thérapeutique*, July 5, 1888.

THE DIAGNOSIS DURING LABOR OF THE TWISTING OF THE CORD ROUND THE NECK OF THE FŒTUS.

In the *Annales de Gynæcologie* for May, 1888, Dr. Turgard states that when, in an occipito-posterior position, rotation has been artificially produced, and when, within a short time, the occiput reverts to its former posterior position, winding of the umbilical cord round the neck of the fœtus may be suspected, and precautions taken to forestall interference with the fœtal circulation.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

The Mississippi Valley Medical Association meets at St. Louis, September 11, 12, 13. The programme thus far arranged includes many papers and discussions of importance. The first day will be given to the discussion of abdominal surgery. The second to infant feeding and some obstetric subject. The third day will be taken up with volunteer papers and some neurological subject. Arrangements for reduced rates are being made, and the society cordially invites all members of the profession to be present.

J. Lucius Gray, *Secretary.*